

TRANSCRIPT OF RECORD.

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1917

No. 172

GREAT NORTHERN RAILWAY COMPANY, PLAINTIFF IN
ERROR,

vs.

ADALINE DONALDSON, AS ADMINISTRATRIX OF THE
ESTATE OF VANCE H. THOMS, DECEASED.

IN ERROR TO THE SUPREME COURT OF THE STATE OF
WASHINGTON.

FILED MAY 22, 1918.

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(25,306)

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1916.

No. 489.

GREAT NORTHERN RAILWAY COMPANY, PLAINTIFF IN
ERROR,

vs.

ADALINE DONALDSON, AS ADMINISTRATRIX OF THE
ESTATE OF VANCE H. THOMS, DECEASED.

IN ERROR TO THE SUPREME COURT OF THE STATE OF
WASHINGTON.

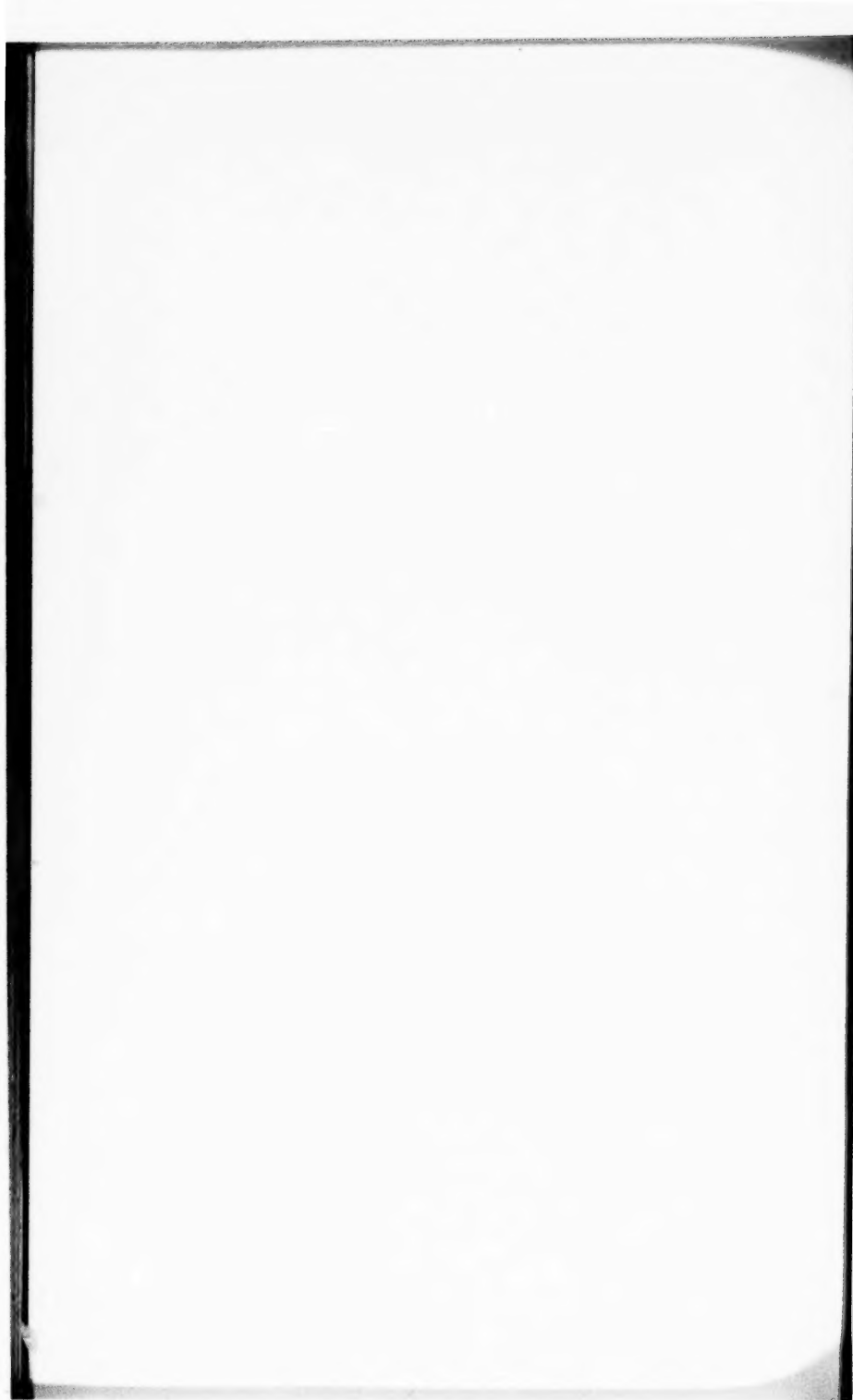
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1 In the Superior Court of the State of Washington in and for
the County of Snohomish.

No. —.

ADALINE DONALDSON, as Administratrix of the Estate of Vance H.
Thoms, Deceased, Plaintiff,

v.

GREAT NORTHERN RAILWAY COMPANY, a Corporation, Defendant.

Amended Complaint.

For a cause of action against defendant, plaintiff alleges:

I.

That the defendant, Great Northern Railway Company, is a corporation duly organized and existing under and by virtue of the laws of the State of Minnesota, owning and operating an interstate railroad system as a common carrier in the State of Washington, and between that state and the State of Idaho and other states.

II.

That the plaintiff is the duly appointed, qualified and acting administratrix of the estate of Vance H. Thoms, deceased, having heretofore been appointed by this court on the 27th day of December, 1913, and that this action is brought under the Federal Employers' Liability Act of April 22, 1908, c. 149, as amended by the Act of April 5, 1910, c. 143.

III.

That Vance H. Thoms previous to and at the time of his injury and death, as hereinafter set forth, was a locomotive engineer employed by the defendant railroad company; that on November 5, 1913, the said Vance H. Thoms while in the performance of his duties as such locomotive engineer, and while employed and engaged in such interstate commerce in operating defendant's engine No. 1902, in hauling loaded freight cars in transit between the several states of the Union, was fatally injured by the explosion of the boiler of said defendant's engine No. 1902; that said
2 injuries directly resulted in the death of said Vance H. Thoms on the same day, at Everett, Snohomish County, Washington.

IV.

That said injury occurred on defendant's tracks between Tonga and Nippon, Washington; that said injury and death was directly caused by the negligence of the said defendant railroad company,

its officers and employes, in that said locomotive boiler on said defendant's engine No. 1902 was insufficient and defective in the following particulars: that the button-heads of the crown-bolts of said boiler were excessively and unnecessarily large and consequently unduly exposed to the direct heat produced by the oil fuel used on said locomotive; that said boiler was not provided with safety fusible plugs, and that scale was negligently allowed by said defendant, its officers and employes, to accumulate upon the crown sheet in said boiler; that for a long time prior to said injury and death the defendant railroad company knew of said defects and insufficiency and of the resulting great danger therefrom.

V.

That the said Vance H. Thoms was, prior to and at the time of his death, an able-bodied man thirty years of age, earning one hundred and eighty (\$180.00) dollars per month, and left surviving him and dependent upon him his mother, Adaline Donaldson, the plaintiff herein, and a niece, Irene Raleigh, aged six years; that said deceased left surviving him no widow, children, nor father.

VI.

That by reason of said injury and death the said mother and niece, and therefore the plaintiff, have been damaged in the sum of twenty thousand (\$20,000.00) dollars.

Wherefore, Plaintiff prays judgment against said defendant for the sum of twenty thousand (\$20,000.00) dollars, and costs.

HIGGINS & HUGHES &
JAMES McCABE,

Attorneys for Plaintiff.

3 STATE OF WASHINGTON,
 County of King, ss:

Adaline Donaldson, being first duly sworn, on oath, deposes and says: That she is the plaintiff above named, that she has read the foregoing complaint, knows the contents thereof and believes the same to be true.

ADALINE DONALDSON.

Subscribed and sworn to before me this 1st day of May, 1914.

HYMAN ZETTLER,
*Notary Public in and for the State,
Residing at Seattle, Washington.*

Endorsed: Filed May 14, 1914. W. F. Martin, County Clerk.

4 In the Superior Court of the State of Washington in and
for the County of Snohomish.

No. —.

ADALINE DONALDSON, as Administratrix of the Estate of Vance H.
Thoms, Deceased, Plaintiff,

v.

GREAT NORTHERN RAILWAY COMPANY, a Corporation, Defendant.

Stipulation.

It is hereby stipulated and agreed by and between the parties hereto, that the plaintiff be permitted to amend the fourth paragraph of her complaint so as to read as in the attached amended complaint.

It is further stipulated that the answer of defendant Railway Company heretofore interposed to the complaint in this action be considered as the answer to the attached amended complaint so that all the new matter contained in said amended complaint be considered denied.

Dated this 1st day of May, 1914.

HIGGINS & HUGHES &
JAMES McCABE,

Attorneys for Plaintiff.

F. V. BROWN &
F. G. DORETY,

Attorneys for Defendant.

Filed May 4, 1914. W. F. Martin, County Clerk.

5 In the Superior Court of the State of Washington in and
for the County of Snohomish.

No. 13831.

ADALINE DONALDSON, as Administratrix of the Estate of Vance H.
Thoms, Deceased, Plaintiff,

v.

GREAT NORTHERN RAILWAY COMPANY, a Corporation, Defendant.

Answer to Amended Complaint.

Now comes the defendant and answers the amended complaint of the plaintiff herein as follows:

I.

Defendant admits Paragraph I of said amended complaint.

II.

Defendant denies that it has any knowledge or information sufficient to enable it to form a belief as to the matters and things alleged in Paragraph 2 of said amended complaint and on said ground denies said paragraph and each and every allegation therein contained.

III.

Defendant admits Paragraph 3 of said amended complaint.

IV.

Defendant admits that the boiler referred to in Paragraph 3 of said amended complaint was not provided with safety fusible plugs and that the injury referred to occurred between Tonga and Nippon, but defendant denies said Paragraph 4 and each and every allegation therein contained except as herein expressly admitted.

V.

Defendant denies that it has any knowledge or information sufficient to enable it to form a belief as to the matters and things alleged in Paragraph 5 of said amended complaint and on said ground denies said paragraph and each and every allegation therein contained.

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VI.

Defendant denies that the plaintiff has been damaged by defendant in the sum of Twenty Thousand Dollars (\$20,000.00) or in any sum.

And for a further, separate and affirmative defense to the supposed cause of action set forth in said amended complaint, defendant alleges that the death of Vance H. Thoms, referred to in said complaint was contributed to by the negligence, imprudence and want of care of the said Vance H. Thoms in that he had allowed the water in the boiler of the locomotive operated by him to become too low thus allowing the crown sheet confining said water to become overheated thereby causing the explosion of said engine.

And for a further, separate and second affirmative defense to said supposed cause of action defendant alleges that the explosion referred to in the amended complaint herein was caused by risks and hazards which were incident to the occupation in which the said Vance H. Thoms was then and there engaged and that said risks and hazards and the negligence of the defendant, if any, were known to and assumed by the said Vance H. Thoms at and prior to the time of the said explosion.

Wherefore having fully answered defendant prays that it may be

hence dismissed with judgment for its costs and disbursements herein and that the plaintiff may take nothing by her complaint.

F. V. BROWN,
F. G. DORETY,
Attorneys for Defendant.

STATE OF WASHINGTON,
County of King, ss:

F. G. Dorety, being duly sworn, says: That he is the attorney for the Great Northern Railway Company, the defendant in the within entitled action; that he knows the contents of the within answer to amended complaint and that he believes the same, and the whole thereof, to be true; that the said defendant is a corporation organized under the laws of the State of Minnesota; that no officer thereof resides or is within the State of Washington.

And further affiant saith not.

F. G. DORETY.

Subscribed and sworn to before me this 9th day of June, A. D. 1914.

[L. M. Knox, N. P., Seal. Com. Exp. Dec. 1, 1914.]

L. M. KNOX,
*Notary Public in and for the State of
Washington, Residing at Seattle.*

We hereby acknowledge service of the foregoing answer to amended complaint and the receipt of a true copy thereof, this 9th day of June, 1914.

HIGGINS & HUGHES,
JAMES McCABE,
Attorneys for P'tff.

Filed Jun- 10, 1914. W. F. Martin, County Clerk.

8 In the Superior Court of the State of Washington in and for the County of Snohomish.

No. —.

ADALINE DONALDSON, as Administratrix of the Estate of Vance H. Thoms, Deceased, Plaintiff,

vs.

GREAT NORTHERN RAILWAY COMPANY, a Corporation, Defendant.

Reply.

Replying to the first and second affirmative defenses contained in the answer of the defendant herein, plaintiff denies each and every allegation therein contained.

Wherefore, Plaintiff prays for judgment as in her complaint demanded.

JAMES McCABE,
HIGGINS & HUGHES,
Attorneys for Plaintiff.

STATE OF WASHINGTON,
County of King, ss:

Adaline Donaldson, as Administratrix of the estate of Vance H. Thoms, deceased, being first duly sworn, on oath deposes and says: That she has read the foregoing reply, knows the contents thereof, and believes the same to be true.

ADALINE DONALDSON.

Subscribed and sworn to before me this 22 day of January, 1914.

HYMAN ZETTLER,
*Notary Public in and for the State of
Washington, Residing at Seattle.*

Copy of the within Reply received and due service of same acknowledged this 22 day of Jan. 1914.

F. V. BROWN &
F. G. DORETY,
Attorneys for Def't.

Filed Jan. 23, 1914. W. F. Martin, County Clerk.

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12500.

In the Superior Court of the State of Washington in and for the
County of Snohomish.

No. 13831.

ADALINE DONALDSON, as Administratrix of the Estate of Vance H.
Thoms, Deceased, Plaintiff,

vs.

GREAT NORTHERN RAILWAY COMPANY, a Corporation, Defendant.

Statement of Facts.

Filed Nov. 20, 1914. C. S. Reinhart, Clerk. F. S. G.
Filed Sep. 28, 1914, W. F. Martin, County Clerk.

- 10 In the Superior Court of the State of Washington in and
for the County of Snohomish.

No. 13831.

ADALINE DONALDSON, as Administratrix of the Estate of Vance H.
Thoms, Deceased, Plaintiff,

vs.

GREAT NORTHERN RAILWAY COMPANY, a Corporation, Defendant.

Statement of Facts.

Messrs. Higging & Hughes and James McCabe, Attorneys for
Plaintiff.

Messrs. F. V. Brown and F. V. Dorety, Attorneys for Defendant.
Trial commenced June 15, 1914, Before the Hon. Ralph C. Bell
and a Jury.

- 11 In the Superior Court of the State of Washington in and
for the County of Snohomish.

No. 13831.

ADALINE DONALDSON, as Administratrix of the Estate of Vance H.
Thoms, Deceased, Plaintiff,

vs.

GREAT NORTHERN RAILWAY COMPANY, a Corporation, Defendant.

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14 In the Superior Court of the State of Washington in and for the County of Snohomish.

No. 13831.

ADALINE DONALDSON, as Administratrix of the Estate of Vance H. Thoms, Deceased, Plaintiff,

vs.

GREAT NORTHERN RAILWAY COMPANY, a Corporation, Defendant.

Statement of Case.

Mr. McCabe: May it please the court and ladies and gentlemen of the jury. The evidence in this case will show that engine No. 1902, used by the Great Northern as a coal burner, was changed by the Great Northern from a coal to an oil burner, and that in making that change they failed to change the heads of the crown bolts of said boiler.

The evidence will show that the great Northern Railway Company failed to use a safety device known as the Safety Fusible Plug, which will prevent boiler explosions.

The evidence will show that the Great Northern Railway Company, the defendant here, did not use proper care and allowed scale to accumulate in the boiler.

The evidence will show that Vance H. Thoms, the engineer, was an able-bodied man, thirty years of age, earning from \$175.00 to \$200.00 per month, and that he was the sole support of his mother.

The evidence will show further that Vance Thoms was in no way to blame for the accident which caused his death, and that the railway company was the cause of the death because they did not use ordinary care in having a safe boiler for Vance Thoms to work with.

15 Mr. Dorety: The defendant reserves its statement.

It is Stipulated, between counsel that the reply heretofore filed and served by the plaintiff to the answer—the original answer—interposed by the defendant is deemed to be a reply to the amended answer to the amended complaint.

THOMAS HANSOM, called as a witness on behalf of plaintiff, being first duly sworn, testified as follows:

Direct examination.

Mr. Zettler:

Q. Mr. Hansom, what is your occupation?

A. Fireman for the Great Northern Railway Company.

Q. Are you now employed by the Great Northern Railway Company?

A. Yes.

Q. How long have you been a fireman?

A. A little over four years.

Q. Were you the fireman on engine No. 1902 on which Vance H. Thoms was killed November 5, 1913?

A. Yes, sir.

Q. At what station did you make the last stop before the accident?

A. Skykomish.

Q. So far as you could observe, Mr. Hansom, what was the condition of the engine when you left Skykomish in regard to its being in good or poor condition?

A. As far as we could observe the engine was in good condition. Normal condition.

Q. On leaving Skykomish how much water did your water glass show?

A. Nearly full.

Q. After leaving Skykomish did you supply your boiler with more water?

16 A. Yes, sir.

Q. How did you do that, Mr. Hansom?

A. With the injector which is used on the locomotive to force water into the boiler.

Q. You worked that injector yourself, personally, did you?

A. Yes, I worked it personally.

Q. Now, Mr. Hansom, about how many inches of water did you maintain in your water glass during the trip?

A. Between 4 and 5 inches as near as possible.

Q. What was the very lowest you allowed the water to become in the water glass on the entire trip from Skykomish to the place of the accident?

A. Now lower than 4 inches.

Q. What was the level of the water in the water glass at the time or immediately prior to the time of the accident, as far as you could observe?

A. About 4 inches.

Q. You may tell the jury what the condition of the water glass was, as to whether it was working properly or not, so far as you could observe?

A. As far as I could observe the water glass was in first class condition; working properly.

Q. On what kind of a curve, on what kind of a track, did the accident occur?

A. On a right hand curve.

Q. Now, Mr. Hansom, you stated that you had about 4 or 5 inches of water in the water glass?

A. Yes, sir.

Q. State, if you know, with 4 or 5 inches of water in the water glass, how many inches of water there would be on the highest point of the crown sheet in the boiler?

A. Between 10 and 12 inches. I should presume.

17 Q. I understand you to say that is above the highest point in the boiler on the crown sheet?

A. Yes, sir.

Q. How does that amount of water, that is 4 or 5 inches in the water glass and 10 or 11 inches above the highest point of the crown sheet, compare with what you usually use in that engine under those circumstances?

A. It is the regular amount of water carried on that engine.

Q. Do you know about how much water an *hour* they use with that engine under those circumstances—about?

A. About 4,000 gallons an hour.

Q. Do you know, and, if you know, state approximately what the grade was at the place of the accident, the grade of the track?

A. The ruling grade is 2.2 per cent.

Q. In what position of the train was the engine on which you and Mr. Thoms were working?

A. About half way in the train; a little towards the rear end.

Q. Then, as I understand you, there were cars in front of you with an engine in front of them?

A. Yes.

Q. And that there were cars behind you?

A. Yes, sir.

Q. And that you were in the middle of the train?

A. Yes, sir.

Q. At the time of the accident, or immediately prior thereto, state, if you know, what Vance Thoms, the engineer, was doing.

A. He was attending to his usual duties as a locomotive engineer.

Q. Did you know Mr. Thoms personally?

A. Yes.

Q. Other than your relation as an engineer?

A. Yes, sir.

Q. Do you know with whom Mr. Thoms lived?

18 A. Yes, sir, he lived with his mother.

Q. State, if you know, what the condition of Mr. Thoms' health was prior to the accident.

A. He was apparently in good health.

Q. What kind of a worker was he?

A. He was a real hard working man.

Q. Do you know what his habits were as to the use of intoxicating liquors or tobacco?

A. I never heard or never knew of him touching any intoxicating liquor or tobacco.

Q. What about his disposition in regard to saving or spending money?

A. He was a saving man.

Q. State, if you know, how much Vance Thoms was earning per month approximately at the time of his death.

A. Why about between \$175.00 and \$190.00 a month, I should judge.

A. Yes, he used to put my time in at the same time he put his in. for the railway company approximately?

A. Yes, he used to put my time in at the same time he put his in.

Q. Do you know what the pay for locomotive engineers was?

A. Yes, sir.

Q. Let me ask you this question, Mr. Hansom: During the time that you were acquainted with Mr. Thoms did he ever indicate to you by his conduct or otherwise his intentions to continue to support his mother.

Mr. Dorety: I object to the question as calling for hearsay testimony, and incompetent, irrelevant and immaterial.

The Court: He may answer the question. It is calling for a "Yes" or "No" answer. Exception allowed.

A. Yes.

Q. State, if you know, in what manner he indicated to you his intentions.

19 A. Why through several different conversations we had.

Q. State what declarations he made, if any.

Mr. Dorety: I object to the question on the same grounds, hearsay and incompetent. (Argument.)

The Court: I will overrule the objection. During the arguments that have been made I do not think he has come within the rule of hearsay. A declaration is inquired for relative to the intention or state of mind toward another person on the part of the deceased, and it is not a declaration of the deceased that is called for that relates to any act of his or conduct of his toward the defendant. He may answer it. Exception.

Q. State what the declarations were that Vance Thoms made to you prior to his death in relation to whether he had the intention of continuing to support his mother or not.

A. During our conversation Mr. Thoms had remarked quite often that he had a mother to support and that he was trying to get a home for her.

Q. And what, if anything, did he say in his declarations as to what his intentions were as to the future support of his mother?

A. In one conversation especially just a few weeks prior to his death he made the remark that he had a good home as long as his mother lived; he had a good home and he would remain single.

Q. Did he say anything as to whether he intended to support his mother in the future?

Mr. Dorety: It is understood to all these questions, they are objected to on the ground of hearsay, incompetent, irrelevant and immaterial also.

The Court: That will be understood. Exception noted.

Q. The question is this, did he during these conversations say to you whether or not it was his intention to continue to support his mother?

20 A. Not any further than the answer I just gave that as long as he had a good home with his mother he would remain single.

Q. Mr. Hansom, did you ever work on engine No. 1902 prior to the accident?

A. Yes, sir.

Q. In what capacity?

A. Fireman.

Q. When you first worked on that engine what kind of an engine was it with reference to the fuel consumed?

A. It was a coal burner at the first time I worked on it.

Q. At that time was that engine used by the Great Northern?

A. Yes, sir.

Q. Was the engine changed as to the kind of fuel?

A. Yes.

Q. What was it changed to?

A. From coal to oil.

Q. When was that?

A. I believe it was some time during 1912.

Q. By whom was it changed, if you know?

A. By the Great Northern, I believe.

Q. Do you know the kind of bolt heads that were used in the engine?

A. I don't know the make they are.

Q. The general size?

A. Yes, sir.

Q. Were these bolt heads changed by the Great Northern when the change was made from a coal burner to an oil burner?

A. They were the same kind of bolts.

Cross-examination.

Mr. Dorcy:

Q. Did Mr. Thoms know that they were the same kind of bolts?

A. I don't know; I suppose he would.

Q. Was it possible to run the engine and not know that?

A. I would not think so; no, sir.

21 Q. Is it not the duty of the engineer to look into the fire box and see that his engine is all right before he goes out on the road?

A. Yes.

Q. So if Mr. Thoms performed his duties he must have known what kind of bolts they were?

Mr. Zettler: We object to that as calling for a conclusion.

The Court: That will be sustained. Exception noted.

Q. In your opinion would it be possible for Mr. Thoms to look into the fire box without seeing the bolts?

A. No, sir, he could not.

Q. And you say it was his duty to look into the fire box?

A. Yes, sir.

Q. The fire box is the place just in front of the cab of the engine where the fire is made?

A. Yes, sir.

Q. And the sheet over the fire is called what?

A. Crown sheet.

Q. That is the crown sheet?

A. Yes.

Q. Above the crown sheet which is just over the fire what is that?

A. Water space.

Q. And a couple of feet above that is the top of the boiler?

A. Yes.

Q. You spoke of the glass for water by which that calls his attention as to depth, is it not in the cab of the engine?

A. Yes.

Q. How deep about? How long?

A. About 12 inches long; about 10 inches in view.

Q. That is in the engineer's position?

A. Yes.

Q. And up against the boiler in the cab?

22 A. Yes.

Q. It is connected with this water space, is it not, by a pipe or valve at each end?

A. Yes.

Q. So that the water in the boiler will take the same level as in the glass?

A. Yes.

Q. As the water comes up the water glass fills up?

A. Yes.

Q. And as the water in the glass runs out the water runs up and fills it on the inside?

A. Yes, sir.

Q. How long have you been in the railroad business altogether, in the engine service?

A. Four years the 10th of last May.

Q. You mean May, 1910?

A. Yes, sir.

Q. Is it not a fact that this change from coal to oil on engine No. 1902 was made almost immediately after you went into the service, or at least some time in 1910?

A. I believe it was a little later. However, I may be mistaken.

Q. For all you can swear positively, it may have been 1910?

A. Yes, sir.

Q. At the time this change was made the Great Northern had another engine—had already had another engine of the same type working in oil for one or two years?

A. Yes, sir.

Q. Was it one or two, do you know?

A. No, I could not swear to that.

Q. And that engine had the same type of bolts that the 1902 had, did it not?

A. I do not know; I never was on the oil burning engine.

23 Q. Is it possible to produce an explosion on a locomotive engine as a result of allowing the water to get too low?

A. Yes, sir.

Mr. Zettler: I object on the ground it is not proper cross-examina-

tion. He is asking for an expert opinion and on a subject that was not referred to in the direct examination.

The Court: That objection will be overruled. The answer may stand. Exception saved.

Q. How high is the lowest point of this water glass on engine No. 1902, above the highest point of the crown sheet?

A. About 7 inches.

Q. Isn't it a fact it is only 3 inches.

A. To the lowest point from the boiler in the water glass, I believe is 3 inches. Then there is nearly 4 inches of metal before you get to the water glass.

Q. So you think that the lowest part of the glass is about 7 inches above the highest point of the crown sheet?

A. Yes.

Q. Are you pretty sure of that?

A. I am pretty sure of it; yes, sir.

Q. The crown sheet itself, this sheet over the fire, is somewhat sloping, is it not?

A. Yes, sir.

Q. A little higher towards the front end of the engine than the back end?

A. Yes.

Q. A couple of inches difference?

A. I could not tell you how much difference there would be.

Q. The sheet is also a little arched, a little higher at the center than at the sides?

A. Yes, sir.

Q. You say that there is a consumption of about 4,000
24 gallons per minute on that engine when it is operated?

A. Per minute?

Q. Per hour?

A. About 4,000 gallons; yes, sir.

Q. Now, how is water put in the boiler to take the place of what goes off in exaporation and steam?

A. Through an injector.

Q. That is worked by a pump.

A. Yes, sir; it is used to force water into the boiler.

Q. The supply from which the steam is made and carried away in the boiler and to take the place of what is evaporated?

A. Yes, sir.

Q. Now, did the engine 1902 have an injector sufficient to furnish that quantity of water?

A. Yes, sir.

Q. As a matter of fact, it had two, did it not?

A. Yes, sir.

Q. Either one of them being more than sufficient to pump that quantity of water into the boiler?

A. Yes.

Q. Was there plenty of water in the tank of the engine for the boiler when the difficulty occurred?

A. Yes, sir.

Q. So that Mr. Thoms had a plentiful supply of water to put in the boiler and proper equipment for getting it into the boiler?

A. Yes, sir.

Q. How is it that low water causes an explosion?

A. It softens the crown sheet in the bolts so that they will not expand to create steam pressure.

Q. That is the water gets off the crown sheet so that it no longer keeps the crown sheet cool?

A. Yes, sir.

-25 Q. What means has the engineer to prevent that thing happening or to tell when it is going to?

A. He has his gauge cocks and the water glass.

Q. The water glass you have already described, will you tell the jury what the gauge cocks are?

A. They are three valves attached to the boiler above the crown sheet whereby the engineer may tell by opening them whether there is water in there or not, and one is placed above the other.

Q. Sort of faucets at different elevations?

A. Yes.

Q. If you turn on the top one you know the water is that high?

A. Yes.

Q. If you turn on the middle one and water does not run out he knows the water is out of that? And so on?

A. Yes.

Q. If the water glass is not working he knows he has not sufficient if it does not run out of the gauge cocks?

A. Yes.

Q. Is it any part of the engineer's duties to watch these gauge cocks?

A. Yes, sir.

Q. Is it any part of his duties to see if the injectors would work when the engine requires water?

A. Yes, sir.

Q. If for some reason the water should get low and he should try his lowest gauge cock and finds water does not run out, and should look at the water glass and sees that no water is in it, is there any step he can take to prevent an explosion?

A. Yes, sir.

Q. What is it?

26 A. By putting the fire out.

Q. This can be done instantly?

A. Yes, sir.

Q. How long had you been firing for Mr. Thoms?

A. I cannot remember the exact time. I fired for him several times.

Q. Were you firing for him when he was reprimanded by one of the officials of the Great Northern for being asleep on his engine?

Mr. Zettler: I object to that question as incompetent for reason that it is not the law that a railroad company may show whether the

employe was in any prior incident incompetent except as to this particular instance.

The Court: I will sustain the objection. Exception entered.

Q. Is it not a fact that you sometimes turn the injector on and it fails to pump water into the boiler?

A. It did that occasionally but you can always tell when it does that.

Q. It is easy enough to find that out and correct it?

A. Yes, sir.

Q. And it would be a part of the duties of the engineer to see that it was actually pumping water into the boiler?

A. Yes, sir.

Q. You spoke of the earnings of Mr. Thoms at the time of his death, it is a fact that engineers are earning a good deal less now than they were then?

A. I don't know; I have not worked on the road since the explosion.

Q. You know a good many had to be set back as firemen on account of lack of business?

A. Yes.

Q. And that those that are working have all been reduced or have had to take poorer runs?

A. Yes.

27 Q. Now, Mr. Hanson, you stated that at no time was there lower than 4 inches of water in this glass?

A. Yes.

Q. Is it not a fact that just before the explosion you looked at the glass and saw only two inches of water in it and that you noticed that the water was stationary and that you called Engineer Thoms' attention to it and asked him to try the gauge cock and that he was doing so or was about to when the explosion occurred?

A. I know when on the right hand curve there was two inches which would stand 4 inches on a 2.2 per cent grade; but so far as the water being stationary in the water glass I have no recollection of that whatever.

Q. Don't you remember of stating on the day after the explosion, on November 6, 1913—You were in the hospital here at that time were you not?

A. Yes, sir.

Q. Don't you remember stating in the presence of Mr. Chemidlin, the representative of this company, and also in the presence of Miss Lena Jacobs, who, I believe, was a nurse, don't you remember of making this statement: "We had gone about six miles from Skykomish and during that time I kept watch on the amount of water in boiler, and while I was looking at water glass to see how much water we had the glass showed two inches, and at that time the explosion took place. I had asked the engineer to try the gauge cocks as the water in the glass appeared to be standing still and I think Engineer Thoms was doing so when the accident took place. The water in glass standing still would indicate that glass was

stopped up and, as glass showed two inches of water, I could not say whether we had any less or not as engineer did not have time to try gauge cocks." Do you remember of making that statement?

28 A. No, sir, I do not.

Q. Do you think it is a fact that you didn't make it?

A. I don't know. I don't have any recollection of ever making it.

Q. You remember giving an account of the accident?

A. No, sir.

Q. You don't remember of giving any account at all?

A. No, sir.

Q. Don't you remember Mr. Chemidlin writing out an account like this (exhibiting defendant's Exhibit 1) in your presence and taking down your statement and reading it to you?

A. No, sir, I don't remember Mr. Chemidlin being up there until three weeks about the accident.

Q. You don't remember of ever giving him a statement about it?

A. No, sir.

Q. You don't remember of his reading one over to you to see if it was all right?

A. No, sir.

Q. You were unable to write yourself at the time?

A. Yes, I believe I was.

Q. Your hands had been injured?

A. Yes.

Redirect examination:

Q. Mr. Hansom, did you operate that engine both as a coal and oil burner, that identical engine?

A. Yes.

Q. Mr. Hansom, what is the usual way to tell whether there is sufficient water in the boiler?

A. By the water glass.

Q. Now is this or is this not a fact, that so long as there is water in the water glass was there or was there not any danger of explosion from low water?

A. No, sir, not if the water glass was properly cleaned out.

29 Q. During this trip what was the condition of the water glass as to whether or not it was in proper condition?

A. It was in good condition.

Q. Counsel asked you something about the injector that would work water but would not put the water in the boiler, that is a condition that you would observe, would you not?

A. Yes, sir.

Q. On this trip was the injector working?

A. Yes, sir.

Q. I mean working so that the water would go into the boiler?

A. Yes, sir.

Q. During the time immediately after the accident in what condition were you mentally and physically?

Mr. Dorety: I object to the question as incompetent, irrelevant and immaterial. He denied that he made any statement.

The Court: Overruled. Exception noted.

Q. What was the state of your mind and physical condition after the accident?

A. I don't know. I didn't have any recollection for about five or six days after the accident.

Q. If you know, were you under the influence of narcotics?

A. I believe I was under the influence of morphine.

Q. About how long was that?

A. I don't know. I have no recollection of the time whatever.

Q. To a fireman or engineer engaged in operating the locomotive engine was there any signs of danger at all that you could observe on that engine in reference to the crown sheet or the bolt heads?

A. There was not.

Q. I don't remember whether I asked you this or not: Are you now employed by the defendant railway?

A. Yes, sir.

30 Recross-examination:

Q. You are not working at the present time?

A. No, sir, I have not been working since the accident.

Q. You say that there would be no possibility of an explosion with water in the glass. That would not be true if the lower pipe were clogged up, or if either pipe were clogged up?

A. No. If the water glass was not working properly, or if the pump valve was clogged up, there could be water in the glass and not any in the boiler.

Q. And you might thus have two inches in the water glass and still have an explosion due to low water?

A. Yes, sir.

Q. When the engine is operating and the glass is in proper condition the water is constantly going up and down?

A. Yes, sir.

Q. As the engine pitches that causes the water to rise and fall?

A. It depends a great deal on what speed you are going.

Q. Would it be true as you were working there that there would be movement in the glass?

A. It would move some but not very much.

Q. Enough so you could tell in a minute if there was water?

A. Yes, sir.

Q. So if there were as a matter of fact 2 inches of water in the glass and it appeared to be standing stationary that would have been an indication that there might be danger?

A. Yes, sir.

Q. Now, was the fireman allowed by Engineer Thoms to work the injector and handle the water?

A. Yes.

Q. Is it not a fact that that is contrary to the instructions given by the railroad company to the engineer?

A. I don't know, I am sure.

31 Q. Don't you know that there is a general bulletin forbidding engineers allowing the firemen to handle those things that the engineers are supposed to do?

A. I have never seen the bulletin, but I was under the impression that the engineer was supposed to oversee that these things were done properly.

Q. You don't know of any bolts or any of those bolts over the crown sheet leaking?

A. There was one bolt leaking.

Q. How long had it been leaking?

A. I don't know. I had not been on that engine for two or three trips before the accident occurred.

Q. Had it been reported?

A. I don't know for sure.

Q. It would be the duty of the engineer to determine whether or not there were any bolts leaking and report them if there were?

A. Yes, sir.

Q. And you don't know whether he had reported any or not?

A. No, sir, I do not.

Q. You don't know if more than one bolt leaked?

A. Only one bolt leaked that morning that the explosion occurred.

Q. When did you see that?

A. At Skykomish.

Q. You had looked in the fire box yourself?

A. Yes.

Q. Otherwise the fire box was in good condition?

A. Yes, sir.

Redirect:

Q. Is there anything unusual in the fact that there is merely one bolt leaking? Is that a sign of danger—very much danger?

A. It is not regarded as such.

(Witness excused.)

32 The Court: Members of the Jury: Until this case is given to you for your final consideration you are not to discuss the case, or any fact connected with it, with any person whomsoever, not even with each other, nor express any opinion concerning the case, or any fact connected with it, to any person whomsoever, not even to each other; and not allow any person to discuss it in your hearing or presence if you can prevent outside of the court room. You are to decide the case upon the evidence given in the court room under oath and not what you might hear outside the trial.

We will now adjourn until 1:30 p. m.

Afternoon Session.

CHARLES E. McGRATH, called as a witness on behalf of plaintiff, being first duly sworn, testified as follows:

Direct examination.

Mr. Zettler:

Q. What is your business, Mr. McGrath?

A. Civil engineer.

Q. In what school did you prepare yourself?

A. In the University of Michigan.

Q. Have you in your profession made a study of steam engines and boilers?

A. I have.

Q. Referring to Plaintiff's Exhibit A for identification, I will ask you, Mr. McGrath, if you made this drawing yourself?

A. I did.

Q. I will ask you now if that is a correct representation of the boiler in this engine No. 1902?

A. Yes, sir.

33 Q. Mr. McGrath, will you come to the drawing here?

(Witnesses steps down from witness chair to Exhibit A.)

Mr. Dorety: Was that map made from some of our drawings of the engine?

Mr. Zettler: Made from your drawing.

Q. Referring to Plaintiff's Exhibit A for identification, to the left hand corner of the plat below, I will ask you whether or not that is a true representation of the crown bolts and crown head used in this engine No. 1902?

A. Yes.

Q. To what scale is that drawn?

A. Drawn to full size.

Q. As I understand you, this is the actual size?

A. The actual size.

Q. Would you kindly mark this as "1" with your pencil?

(Witness marks Figure 1.)

Mr. Zettler: At this time I offer this drawing in evidence.

Mr. Dorety: No objection.

The Court: It may be received.

Q. Now, Mr. McGrath, explain what the crown sheet of the boiler is, this boiler here, and what its appearance was.

A. The crown sheet is the top sheet of the fire box, shown by that heavy line (indicating).

Q. What is its use?

A. Well, it is simply the upper sheet of the fire box.

Q. What is on top of the crown sheet?

A. Water is on top of the crown sheet.

Q. Now, referring to that portion of Plaintiff's Exhibit A which you marked 1, explain just what that is and what its uses are, if you can.

A. That is the crown bolt and its use is to hold up the crown sheet of the fire box. It is fastened to the top of the boiler on top
34 and to the crown sheet on the bottom, as are represented by the red lines.

Q. Will you explain to the jury, if you can, what these lines of Plaintiff's Exhibit A, which are dotted and in red, are.

A. The dotted red lines are the water level of the water when the engine is on a 2.2 grade. The upper line is the water level when the water is at the highest point on the crown sheet on that grade, and the lower line is the water level when the engine is on a 2.2 per cent. grade and the water is flush with the lower part of the crown sheet.

Q. How much, if any, is the crown sheet higher at the front of the boiler than towards the rear?

A. That is 3 inches.

Q. Now, Mr. McGrath, assuming the water in the boiler to be flush with the back of the crown sheet, how much water would it take to fill the boiler to the level flush with the front end of the crown sheet? Have you made calculation?

A. I have made calculation on that. 412 gallons approximately.

Q. Assuming, Mr. McGrath, that the engine uses about 4,000 gallons of water per hour and that the water in the boiler is flush with the front or higher part of the crown sheet, how long, by your calculation, would it be before the whole crown sheet is bare of water, approximately?

A. About 6.2 minutes.

Q. Do you know what the approximate heat or temperature of an oil burning flame is?

A. It is approximately 3,000 degrees.

Q. Let me ask you this, Mr. McGrath, what degree of heat does heat affect the crown sheet so that it becomes permanently and visibly discolored?

A. It will affect it by the time it reaches 1500° at least.

Q. Now, when, by your calculations, Mr. McGrath, how
35 long after the front part or the higher part of the crown sheet is bare of water would it be so discolored that you could notice that discoloration, permanently?

A. About three minutes, I should judge.

Q. Then, Mr. McGrath, in about three minutes after the water leaves the front of the crown sheet, how much of a space on the crown sheet would be permanently discolored?

A. Two or three square feet.

Q. That discoloration would be observable after the crown sheet had become cooled?

A. It would.

Q. It would ever after be observable?

A. Yes, sir.

Q. Just point out on the drawing about where the water would be

on the front flue sheet if the water were flush with the lower or back part of the crown sheet?

A. That lower dotted line would show that. Right there (ind.).

Q. Mark that with a figure 2.

(Witness marks Exhibit A with figure "2.")

Q. I mean the front of the sheet.

A. The front of the sheet would be at this point marked with "2."

Q. What in your opinion as an expert happens to the metal in the flue sheets when directly exposed to the flame?

Mr. Dorety: We object to the opinion. The witness has not been shown to have had any experience in that line. He testified he was a civil engineer.

The Court: I will sustain the objection. Exception allowed.

Q. Are you familiar, Mr. McGrath, with the effect of heat on flues and flue sheets?

A. I am familiar with the effect of heat upon iron.

Q. What is the flue or flue sheet composed of?

A. Iron and steel.

36 Q. And being familiar with that, I ask you this, what effect, when directly applied to the flues or flue sheets, would be an oil flame of heat on the metal without the intervention of water?

Mr. Dorety: Same objection.

The Court: Overruled. Exception saved.

A. It would burn it.

Q. Would that effect be noticeable long after?

A. It would.

Q. Referring now to Plaintiff's Exhibit A and particularly to the figure marked 1 on that exhibit, state, if you know, what effect the heat of an oil-burning flame has on that sort of a bolt head shown on there of the boiler in use?

A. It would tend to burn the head, tend to overheat the head and burn it.

Q. What result would that have?

A. It would result in an explosion.

Q. Would you kindly mark the other bolt there with a figure 3?

(Witness marks Exhibit A.)

Q. Calling your attention to crown bolt marked 3 on plaintiff's Exhibit A and the button head thereof, I will ask you if the heat of an oil-burning flame in a locomotive would have the same effect on this same kind of a head?

Mr. Dorety: I will object to the question on the ground that no sufficient foundation has been laid. I do not think that the witness is competent to testify. I don't think the question is proper. He has testified that he knows the effect of fire on iron and that is all that he has testified to.

The Court: Overruled. Exception entered.

A. The head is marked red and is shown to be very much smaller than this marked 1, and the effect upon that would be that the oil would not tend to burn it as it does on 1.

Q. Do you know, Mr. McGrath, the purposes and uses of safety fusible plugs in crown sheets in boilers.

37 A. Yes, I know.

Q. Explain to the jury then what a safety fusible plug is.

A. A safety fusible plug is a plug put in the crown sheet, run through it, of such a nature *what* when the crown sheet becomes overheated the interior or center of this plug will melt and that will allow water to pass from the boiler upon the fire, from there down to the fire and quench the fire.

Q. What is the purpose, if you know, of using safety fusible plugs?

A. To prevent explosions.

Q. Testifying as an expert, is there any reason that you know of why safety fusible plugs cannot be used conveniently on the crown sheets looking towards the prevention of explosions?

A. There is no reason.

Q. Mr. McGrath, do you have knowledge of what scale is in a boiler and its effect?

A. Yes, I do.

Q. Then state, if you know, what effect, if any, has the accumulation of scale in a boiler upon the effectiveness of the bolt heads to prevent explosions?

A. Scale will tend to accumulate around the bolts on the upper side of the crown sheet, and scale is a non-conductor; also after heating and being a non-conductor, the heat of the fire will accumulate in the bolt heads and penetrate into the interior of the bolt and overheat it, causing the heat not to be conducted away.

Cross-examination.

Mr. Dorety:

Q. How old a man are you?

A. Twenty-eight.

Q. What was your class in college.

A. '09.

Q. 1909?

38 A. 1909.

Q. You studied mechanical engineering?

A. I have taken mechanical engineering in connection with civil engineering.

Q. Your degree was in civil engineering?

A. Yes.

Q. What is your employment now?

A. I am practicing civil engineering.

Q. Practicing for yourself?

A. Yes.

Q. That is you are not in the employ of any one company or individual?

A. No, sir.

Q. Where are you located?

A. In Seattle.

Q. Have you had occasion to make a special study of boiler designing and construction since your graduation?

A. I have been connected with that work more or less since my graduation.

Q. How many boilers or engines have you actually designed since your graduation?

A. I have not designed any.

Q. In what way have you had occasion to study this matter?

A. I made a special study of it; took a special course.

Q. I mean since your graduation?

A. Since graduation I have studied in connection with a manufacturing establishment for about five months in one case and with another one for about two months.

Q. What was the character of these manufacturing establishments?

A. One was the United States Gypsum Company, of Alabaster, Michigan.

Q. What was the other?

A. The Hofius Steel Company, of Seattle.

39 Q. Were you in the manufacturing end of the Hofius Steel Company?

A. I was.

Q. Do they manufacture boilers?

A. They do.

Q. What was the character of your work for them?

A. I was draftsman.

Q. Designing boilers?

A. Not particularly boilers but designing various articles; the structural end.

Q. Did you have anything to do with designing boilers for them?

A. I don't know whether I did or not.

Q. Did you for the Gypsum Company?

A. I did the designing of repairs.

Q. That is of the boilers they used themselves?

A. Yes.

Q. They had a number of boilers, of course?

A. Yes, I think they had six or seven.

Q. How long were you with them?

A. Five months.

Q. Then the designing of repairs for those half dozen boilers for five months was the only actual experience you have had since your graduation?

A. I had six years' experience since graduation.

Q. I mean in this particular field of boiler construction?

A. Yes.

Q. Now, designing the repairing of boilers would not call for a very heavy outlay of mental energy or scientific study of boiler construction?

A. It would give you a pretty good insight into the construction of boilers?

Q. Would you consider yourself, after that experience, an expert boiler man?

40 A. I could design a boiler, I think, without very much trouble.

Q. That hardly answers my question. As you look at yourself would you consider yourself an expert boiler man after your experience mending those six boilers for five months?

A. I hardly know what an expert man is. I have no definition about that.

Q. Would you consider with your knowledge of boiler construction and the effect of heat on a boiler, etc., you would rank high in comparison with men whose business that is?

A. I think it would — fairly high.

Q. When you were working for the Gypsum Company did you go out with the men and do any of the work?

A. Yes, I did; I did that in connection with the designing itself.

Q. You would first design it and then go out and carry out the design?

A. Yes.

Q. You worked on the principle that Mr. Squire gave his pupils in the Squire School—supply the design and then go and do it?

A. Yes.

Q. Did they use oil burners?

A. No, they did not. Coal.

Q. Have you had any actual experience with oil burning boilers?

A. No, sir.

Q. Have you ever seen a bolt of either of those types that have been used in oil burning engines?

A. I probably seen a good many of them.

Q. That is in place or taken out?

Q. Taken out.

Q. When you say that the head marked No. 1 would burn and the other one would not burn, you, of course, are assuming that there is water above the crown sheet in both cases?

A. I am, sir.

Q. If you place water then above head No. 3—the one toward you—the metal would not deteriorate from the action of the fire, you think?

41 A. No, it would not.

Q. Do you know whether the type of bolt shown in No. 1 here, as that is drawn, is like the bolts in use on Great Northern equipment?

A. I assume that by their standard design of this engine.

Q. You understand that they was never put in operation with that *square* head on them?

A. I understood they were.

Q. You understood they were?

A. Yes, sir.

Q. If you change your understanding and assume they are not.

that that head is used simply to screw them in with and that it is then taken off, would that change your opinion?

A. It makes no difference.

Q. You would still think that this head would burn?

A. Yes.

Q. If you take a head of this sort (ind.) which will not burn and put a cap over it the exact size of this head (ind.) without the square and fitting close, would this head suffer more or less? I mean would it suffer more when exposed to the fire or more if it had this cap of metal over it to protect it from the fire?

A. It depends upon how you put your cap on it. If it was put so it was separated by the bolt it would have the same effect as the other head.

Q. Your idea is that metal over this to protect it from the fire is not a protection at all?

A. The metal would be in that case, but it depends upon how you put it over the bolt.

Q. Suppose it is welded to it?

42 A. Welded to the bolt by a bolt?

Q. Welded to the head it would have the same effect; welded to the bolt it would not.

Q. The same effect as in this?

Q. The same effect as welded to the bolt. The heat would have the same effect upon this as on the other bolt.

Q. I am speaking of the effect on so much of the bolt as appears on No. 3. You say if the cap were put over this portion of the bolt it would be more injuriously affected than without the cap, is that right?

A. Not if the cap were welded to the crown sheet.

Q. Assuming that it were welded to the bolt?

A. Then it would have just as much effect as it would in the other case.

Q. And your idea is that with the cap welded to the bolt this part of the metal in here (ind.) would be injured?

A. Yes, possibly as low as that.

Q. On what possible theory is that, Mr. McGrath?

A. Shall I point it out?

Q. Yes.

A. When this crown sheet becomes affected by the effect of high heat to allow an actual thinness, there is a conduct in the expansion in that crown sheet, and, assuming that the difference in temperature between this crown sheet and this sheet here were 700 degrees—which is a conservative estimate—it would be nearly half an inch at this point. This tends to move this part forward while this remains stationary. In this case it tends to move this part over this way (ind.). This would open up a space right in there and that space would allow an accumulation of gas under the head of the bolt and that gas is a good non-conductor of heat and, being a non-conductor of heat, the heat of a furnace fire—furnace heat—

43 will follow up the bolt and over heat it so it will become soft, and in becoming soft it has practically no strength, and the high pressure of the water on the crown sheet will cause the bolt to pull off from the crown sheet.

Q. In the first place you say there is a difference of 700 degrees between the top of the crown sheet and the top of the boiler?

A. I think that is conservative.

Q. What is the temperature of water?

A. With 200 pounds pressure it is about 380 degrees.

Q. And is the temperature of the crown sheet 320 degrees?

A. It would be much more.

Q. 320 degrees above the temperature of the water?

A. Take 380 for the temperature of the water.

Q. 320 above that would be 700?

A. Not necessarily 320 degrees higher than that. This water up here would be in the neighborhood of 250 degrees. This down here would possibly be more than that. This is considerably lower on the upper side and the other is probably 900 degrees—I think that would be conservative—and if this is 200 degrees there would be a difference in temperature of about 700 degrees.

Q. Now, about how long would it take, Mr. McGrath, to produce this effect on these bolts?

A. Well, it would have to be several heatings and coolings to loosen them up sufficiently.

Q. Would it take a week or two?

A. It might take a week or two and it might only take one heating and cooling.

Q. Now, is it your idea that this sheet gets hot to a temperature of 900 degrees and retains its normal color, that is it is not red hot?

A. Red hot is a little over 1,000.

44 Q. You are speaking of heat?

A. Yes.

Q. Are you basing your testimony on any measurements that you have made yourself or any tests you have taken or book authority?

A. Book authority.

Q. What is your authority?

A. A book which I have there (referring to book on desk).

Q. What is it?

A. C. E. Stromeyer.

Q. Will you show me the table. I want to know at what temperature the iron gets red hot.

(Witness examined book.)

Q. Would you accept Kent's Mechanical Engineering as an authority?

A. Yes.

Q. I will ask you to look at this table and see if it would not convince you that you are wrong.

A. That depends entirely upon where it is displayed. If it is

displayed in the dark it might be that; if in the light it would be more.

Q. Would it make 400 degrees difference?

A. Yes.

Q. Then you would not accept Mr. Kent when he says it shows red at 509?

A. Very likely.

Q. And that it is ordinarily raised from 200 to 400 degrees higher than that in operation?

A. It would be in the interior at least.

Q. What percentage of its tensile strength will steel retain at a temperature of from 900 to 1,000 degrees?

A. I don't know. I don't think there is any authority on that.

Q. Would you accept Mr. Kent on that?

A. What issue?

45 Q. 1913, the last edition.

A. That is probably a good authority.

Q. You spoke of these fusible plugs at what temperature do they melt?

A. They melt just above the boiling temperature of the water at the pressure used in the boiler.

Q. They melt at just a little over 400 degrees?

A. Yes.

Q. If that sheet were 700 degrees would they melt?

A. The sheet on the interior and from this column (ind.) would be probably 700 degrees, but above this would be less.

Q. Above that it would be less than that?

A. On the other side about 400.

Q. And pretty well over it would have to be lower?

A. I would not say very much. It is a very gradual gradation.

Q. It would have to be 400 clear through the fusible frame for it, or whatever it is, before the fusible plug would melt?

A. Yes, it would.

Q. So it would have to be 400 degrees clear through the fusible plug?

A. Yes.

Q. How thick is a fusible plug?

A. In what direction do you mean?

Q. Up and down.

A. I could not say the exact dimension.

Q. You have seen drawings of them?

A. Yes.

Q. You know they are thicker than the sheet?

A. Yes.

Q. You know the lowest surface of the plug is farther from the water and nearer the fire than the crown sheet?

A. On the lower surface?

46 Q. Yes.

A. If this is the surface of the crown sheet and the water up here and the fusible plug is screwed in the crown sheet that way.

Q. The metal extends farther from the water, assuming this piece

(ind.) is metal, it extends farther from the water than any metal in the crown sheet, doesn't it?

A. Well, it may; I have not seen them in place.

Q. You have seen diagrams of them? You know that to be a fact?

A. I think that is true.

Q. You know also that the lowest part of this can never go above 420 degrees or it would melt?

A. No, I don't know that. In fact if it didn't go above that it certainly could not be applied to the direct action of the flame.

Q. You know they are deemed to melt at 420 degrees no matter how they are exposed?

A. If that were 400 degrees they would certainly melt.

Q. Can you give any reason why the crown sheet should be 900 degrees and the metal right next to it only 400 degrees?

A. I don't know that the metal right next is only 400 degrees.

Q. You did know it?

A. I did not.

Q. You know it would be over 400 degrees, am I logical?

A. It certainly must be over 400 degrees next to the flame. It cannot very well help but be.

Q. Then why doesn't it melt? Where did you get your idea that the crown sheet will get 900 degrees in operation? You never saw a statement to that effect in a book?

A. From the fact that the crown sheet on top—I am not speaking of any crown sheet——

Q. Any part of it? Did any of your professors ever tell you
47 or did you ever see any book that said any part of a crown sheet would get 900 degrees with the water on it?

A. The temperature of a furnace is about 2,000 degrees in coal burning and 3,000 degrees in oil burning. It is reached in the direct contact with the lower part of the crown sheet, and the lower side of the crown sheet would be considerable hotter than the upper.

Q. You figure that it is 400 degrees in the water on one side and 2500 on the other so it must be about half way between?

A. The lower surface is less than that.

Q. That is a sort of a guess? You have no authority or measurement?

A. No.

Q. Now, according to the table in question, I believe, that iron raised to 900 degrees has less than half its strength, so it is hardly likely that this iron is raised that high?

A. Yes, that would not make any difference in the strength of it for it is only a very small layer, the layer raised to that temperature.

Q. Do you know you can take a tea kettle and fill it with water and set it on the fire and get it to boiling—bubbling—and take it off and put it on your hand and carry it away and not burn you?

A. Yes.

Q. It is a fact that the bottom of the kettle, the bottom of the kettle is just the temperature of the water, you know that?

A. Yes.

Q. You know you can take a paper bag and fill it with water and put a torch under it and not burn it?

A. Yes.

Q. And the reason is the water absorbs all the heat that the fire gives to the metal?

A. It is conducted away from it.

48 Q. Don't you know, as a matter of fact, it does the same thing with this sheet, the water conducts the heat away from it?

A. (No answer.)

Q. Don't you want to take your testimony that that crown sheet gets 900 degrees?

A. Not at all. The both sides of it would be——

Q. Don't you want to take back your testimony that the metal in the plug would melt out at a little over 400 degrees and that it does not melt. If there is a reasonable explanation to that I would like to have it. You say the metal would not melt and it would melt if it gets over 400 degrees. If you can explain that you may do so.

A. I am speaking of the very thin layer sheet, the lower side next the fire. It would be the same thing in the plug.

Q. How about the layer of thin metal in the plug?

A. It probably applies to this layer of metal, the layer on the bolt side.

Q. Your idea is that there is a kind of a film of melted metal for space up there to protect the rest of it?

A. In there, yes.

Q. Now, Mr. McGrath, your whole objection to this bolt is based on this idea that you figured out in your head somewhere that the lower surface of that sheet gets up to 900 degrees?

A. Not necessarily. That was stated incidentally to show the effect the difference in temperature would be.

Q. It is based on your book theory that you formed that this layer of metal gets very hot?

A. The only theory that I desire to state in that respect is that it moves back and forth to a considerable extent.

Q. What moves back and forth?

A. The crown sheet moves back and forth at this difference in temperature.

49 Q. Do you get it as a result of this reasoning yourself or have you ever seen any other evidence of that or read on it or did the professors tell you that?

A. The professors never told me that. I have seen the statements in books to a great extent about the effects of temperature.

Q. Did the books tell you that this kind of a bolt was not a very good thing to use?

A. Yes, they did.

Q. I suppose you are familiar with Cole's experiments?

A. No.

Q. Are you familiar with Barr's books on boilers and furnaces?

A. I have had Ewing's books. I don't know of any other just now.

Q. Have you ever read of any experiments on bolts of that character?

A. I have read of the results of experiments.

Q. Have you read of a series of experiments by a man by the name of Cole in 1897 and of various tests of bolt heads in which they concluded that this was the best type of bolt head there was and recommended it?

A. No. I have not. I have read of the recommendations in one of these books on the various types of bolt heads.

Q. That is in this International Correspondence School?

A. No.

Q. Is this same expansion and contraction you speak of, does that exist in a coal burner too?

A. It does, but it would not be to such an extent.

Q. What is the temperature in a fire box burning coal?

A. I think it would be about 2200 degrees.

Q. Have you seen experiments that the temperature in a fire box burning oil which shows the temperature from 2200 to 2500 degrees—2500 as the maximum?

A. No, I did not.

Q. Where did you get the idea it went to 3,000?

A. In comparing it with the temperature of a coal burning flame and proportioning it in a theoretical temperature, an actual temperature of a coal burning flame and a theoretical temperature of an oil burning flame, and proportioning it would give it a temperature of about 3,400 degrees. That is a rough approximation. A coal burning flame has a theoretical temperature of 2700 degrees. I know of experiments which show the actual temperature to be about 2200 degrees; and the theoretical temperature of an oil burning flame is about 4200. Proportioning this it would be about 3,400 for the temperature of an oil burning flame. Moreover, the oil burning flame would be rendered a little bit more closer than the coal burning flame and ought to give as good results.

Q. Would it surprise you to learn that tests had been made of the actual temperature and found from 2200 to 2,500 degrees—2,500 as a maximum—in an oil burner?

A. Yes, it would.

Q. If it was demonstrated to you that such tests have been made wouldn't you conclude that these bolts are at least as serviceable in an oil burning engine as a coal burning engine?

A. No. I don't think it would.

Q. You still insist it is a bad thing?

A. I will give another evidence of that temperature: When a person puts a rake or some other piece of steel in a furnace of coal burning flame in a very few seconds it will reach a white heat, it will reach a fusion, and that heap is all solid; it would be the material of which the rake is made; it would be about 2,500 degrees, so the furnace would be hotter than that or it would not reach that degree.

Q. You are speaking of a coal fire or oil fire?

A. Oil fire.

Q. What would be your guess as to how hot the lower layer of this sheet would be with a coal burning engine.

51 Mr. Zeller: I object to that on the ground that guess is no evidence.

The Court: I will sustain the objection.

Q. Make your estimate then in the same way. Have you made that estimate as to an oil burner? What would your estimate be as to the degrees of this lower layer in this sheet in a coal burning engine?

A. As I said, about 900 degrees.

Q. Burning coal?

A. With a coal burning engine it would be about there, also.

Q. About the same?

A. Yes.

Q. Why wouldn't there be as much contraction and expansion and as much damage to the engine in burning coal as oil?

A. The flame underneath is considerably hotter and I would *say* that it probably would be a little hotter than the coal burning furnace.

Q. Wouldn't you agree with me to this extent, that this reasoning in deduction of yours would tend to make this character of bolt objectionable in a coal burning engine even though it would not be quite so objectionable in burning oil?

A. No, it would not. In fact, the heat is conducted away in both cases, and in the higher temperature of an oil burning flame the heat cannot be conducted away so rapidly as it can in a coal burning flame.

Q. I do not understand you. See if I can make it clear: You say that this bolt—that is the head on that bolt—No. 1 is better than No. 3 on an oil burner?

A. No. 3 is better than No. 1 on an oil burning engine because this sheet gets so hot on an oil burner that it contracts and expands and allows gas in under here (ind.) and thereby insults this by the water.

Q. And it is burned?

52 A. I don't think I testified in that case in an oil burner and a coal burner, although the oil burner would be somewhat hotter because of the greater change in the movement.

Q. It would follow from your reasoning that this bolt No. 3 would be better than No. 1 even in a coal burner?

A. I didn't finish my statement——

Q. I beg your pardon.

A. The movement in either case would probably cause a slight opening under the head of the larger bolt and, since the flame of an oil burning furnace is very much hotter than the coal burning furnace, the heat would have a much greater tendency to burn since there was a non-conducting layer between the head and fire box, and the degree to which the heat would develop would depend upon the relative degrees of temperatures of the two flames—that of

the oil burning flame of heat would be developed very much more rapidly.

Q. You say in theory at least this insulating material would form in there in either one?

A. Yes, it would; it would be very much more apt to in an oil burner.

Q. Wouldn't it be a better plan, even in a coal engine, to have them all use this kind of a head?

A. I think it would.

Q. Did you ever hear of a railroad using this kind of a head in a coal burning engine, No. 3?

A. I think that most of them use them now on the side of the furnace.

Q. Did you ever hear of them using them on the crown sheet?

A. I would not say as to that.

Q. Don't you know as a matter of fact that the Baldwin Locomotive Company and the big engine manufacturers use that type of bolts on the crown sheets? (No. 1)

A. I don't know what they use.

Q. You were expected to know that, know what these companies use.

53 Q. Didn't you ever have occasion to look up and see what kind of bolts they use on locomotive engines?

A. Not on locomotives. In stationary.

Q. You are not a specialist on locomotives?

A. No, not on locomotives.

Q. A pretty good way to test your theory to find out whether insulating material really forms there, would be to take the head off and look and see, wouldn't it?

A. The insulating material would be a gas.

Q. You could not see it?

A. No.

Q. Now, how many trips did you say this head would run and retain its strength?

A. If it got overheated at any one trip it would not retain its strength.

Q. Wouldn't you expect it to become weakened in a month or six weeks?

A. I think it would become weakened in a month, yes.

Q. Now, a good way to determine, they could easily be tested, couldn't they, by taking a bolt that had been used a month and test it.

A. You are assuming that the metal is greatly weakened, I presume?

Q. I am not assuming it; you are saying it.

A. I am not saying that the metal itself weakens in any one heating.

Q. You would expect that in the course of a month every bolt in the engine would be weakened some?

A. No, not necessarily. After it is cooled off it would retain

the same strength, or pretty near that anyhow.

Q. Would it ever become weakened?

A. It becomes weakened when it becomes hot.

Q. Would it ever become permanently weakened?

A. Yes, at any time while crystal-ized.

Q. How long would that take?

54 A. Anywhere from a month to twenty years.

Q. What would be the tensile strength of any such bolt. How much of a pull would a bolt stand without any heat on it at all, just screwed into a plate? Did you ever see any tests on that?

A. I have seen tests not on that directly but on the strength of material in place and that would give it by a computation that could be made.

Q. Have you any idea of what tensile strength of the bolts 1 and 3 is?

A. I believe they are 1 inch bolts.

Q. 1 1/8.

A. The bottom or all through or at the center?

Q. I believe it is an inch and a quarter at the bottom. I believe they are tapered.

A. An inch and a quarter at the extreme?

Q. Yes.

A. A little over.

Q. Assume they are one inch.

A. That would be 6,200 pounds fiber stress.

Q. You assume that the iron would pull about 8,000 pounds?

A. For safe stress.

Q. Is that all you give us?

A. 6,200.

Q. Do you know what the specifications of a bolt call for?

A. 8,000 is generally considered about the best to use.

Q. 8,000 per square inch?

A. Yes.

Q. Where did you get that?

A. I have got that out of several authorities.

Q. Have you one of them here?

A. I have one right here.

55 Q. You would recognize the proceedings of the American Society for Testing Materials as good authority on that, the best in fact?

A. Probably the best.

Q. I notice they give for 1912 standard designs for locomotives.

A. What kind?

Q. Forty-nine and fifty thousand.

A. I am using the straight working stress.

Q. Perhaps we are talking about different things. They say that a bolt like that would have to stand a pull of 50,000 pounds before it would break, otherwise it would not be used?

A. Yes, it would.

Q. And that they would never break at 6,000 or 8,000 pounds?

A. The safe working stress is 8,000; much less for any defects in material or for any other reason it might be weak.

Q. How much of a pull would the threads in a sheet of that kind stand before they would pull out, assuming you had no head on the bolt?

A. That is a matter of calculation.

Q. Can you give it roughly?

A. I better figure it.

Q. If a bolt like that were screwed in a plate without any head at all and the bolt pulled, would you expect the bolt to break or the threads give way?

A. The threads would give way first.

Q. Give us your idea.

A. Is that a $\frac{3}{8}$ inch plate?

Q. Yes, a $\frac{3}{8}$ inch plate.

A. I would put it about 2,100 pounds.

Q. Would you have access to the proceedings of the Society of Mechanical Engineers? Can you look that up?

A. Yes.

Q. Would you have access to this book of Barr that I mentioned?

A. I probably have access to it; I don't know.

56 Q. I would like to have you look up, Mr. McGrath, look up for tomorrow the proceedings of the American Society of Mechanical Engineers for 1897 or this work of Barr on Boilers and Furnaces or the experiments of Francis J. Cole—I think you will find it in any book on boiler fittings—and tell the jury whether the result of those experiments was not to recommend the use of this button-head bolt, and also whether it was not demonstrated by those experiments that even though there was no head on the bolt the bolt would break before the threads gave way? In other words, that the threads would stand instead of 2000, 50,000?

A. (In answer to this question Mr. Dorety agreed that he would have the book in court on the following day.)

Q. Why did you say that the weak-ing of this head would not be a gradual matter?

A. I said that the weakening would not be a gradual matter.

Q. If I understand your testimony correctly it is that the large button head, such as shown in No. 1, you would expect it to become red hot and drop off because of this insulting?

A. Not necessarily drop off. It would become red hot and weaken.

Q. Would you expect it to occur the first time it is used a short time—

A. No, not until a rather high gap had opened up between the bolt head and the sheet.

Q. How long would it take to form that gap?

A. That would be hard to say.

Q. You never had any practical experience from which you could determine that?

A. No.

Q. Have you read and reports on it?

A. No, I have not; merely a matter of experience in running an engine I would say.

Q. Figuring from your own experience can you state a maximum limit? Would you expect it to be there in six months?

57 A. I think a person to have occasion to have experience in that would find it varied a great deal.

Q. Would you expect it to occur in six months?

A. All I can say would be a guess.

Q. We would not prevent you from making a guess.

Mr. Zettler: We object to that; he is calling for his guess.

Mr. Dorety: We are entitled to his guess, I think.

The Court: I do not think you are entitled to a guess. He may give his opinion.

Mr. Dorety: I objected to the witness testifying at all on the ground he didn't know anything about it. Now, I think we are entitled to best guess. * * *

The Court: I will sustain the objection.

Exception.

Q. After this opening would become formed there, Mr. McGrath—whether it took two months or six months or a year—after this little insulation would form between the button head and the crown sheet—would you expect then that the crown sheet would become red every trip?

A. Yes, it very likely would.

Q. How much weight does a bolt of this sort carry, have to carry in practice?

A. I think those bolts are supposed to be four inches apart—that would be 3,200 pounds.

Q. 3,200 pounds?

A. Yes.

Q. Now, you say the threads would stand to carry about 2,000 of that so that the other 1,200 pounds would have to be carried by the head, would it not?

A. Yes.

Q. Would you expect this red hot bolt to carry that 1,200 pounds very long?

A. It would necessarily have to carry it.

58 Q. It would have to carry it or give way?

A. Yes.

Q. Wouldn't you expect it to give way pretty soon?

A. Yes.

Q. How hot would you expect the bolt to get, the head of it, the point—practically the temperature of the fire?

A. No, hardly that.

Q. What would you say?

A. It would be red hot.

Q. 1,500?

A. May be 1,500.

Q. Do you know how much of its strength would be gone at that temperature?

A. It would be mostly gone.

Q. About 90 per cent, of it gone?

A. I presume so.

Q. Would you not state this, or is it not the rational deduction from the facts and figures you have given, that after this insulating scale once became formed, the heads would have to support 12,000 pounds if the same would be supported at all, and that a good many of these bolts would not support it at that temperature, they would have to give way?

A. They would have to support it, but one side would be in contact with the material and would retain most of its strength.

Q. One side would be in contact with the material, one side of the head.

A. If there was a movement forward on the crown sheet, one side would be more or less in contact with the sheet.

Q. How about this scale?

A. That would be mostly on the other side, opposite the side that was in contact.

Q. I don't understand you. You said that the reason this
59 button head was bad was because it would get hot, and the reason it would get hot was because it was so far away from the crown sheet?

A. Yes.

Q. You say it is only insulated on one side?

A. Yes, in certain positions.

Q. Then, there is one side that is not insulated all the time?

A. Yes, it would be partly insulated.

Q. Couldn't that one side be a pretty good support? Wouldn't it be better than no head at all?

A. That is probably what holds it.

Q. With a button-head bolt, with a bolt like No. 1, haven't you everything that you have in No. 3 and a support in addition?

A. No, you have not. It is a matter of degree.

Q. Now, what have you got here that you wouldn't have here? What have you got in No. 3 that you wouldn't have in No. 1?

A. The head would probably retain contact around the head where that button occurs.

Q. Which, according to this diagram is a very thin scale?

A. They have to be made thick enough for the strength.

Q. Now, according to your last testimony, haven't you got everything here that you have here (ind.), that is this scale of material at the surface and, in addition, the bolt holding on one side or the other all the time?

A. (No answer.)

Q. That is everything that you have in No. 1 that you have in No. 3? In other words, haven't you got in No. 1 all the metal hold that you have in No. 3 and, in addition, this head holding on one side or the other all the time?

A. You have too much in No. 1.

Q. You have got something holding in No. 1 that you have not got in No. 3, haven't you?

A. Yes, but you have a good deal more holding in No. 3 that you haven't got in No. 1.

Q. What is that?

A. You have it holding entirely upon the circumference of the head in No. 3 and you would only have a very small portion of it that would be in contact in No. 1.

Q. About 1/16 of an inch holding upon No. 3, that is it, isn't it?

A. It is still farther there, the point over there, (Ind.)

Q. About 1/16 of an inch thick?

A. It looks a little larger than that to me from here. That would be a matter of adjustment, however, of course.

Q. You would recommend making it a little thicker?

A. No, not necessarily thicker than what it shows there, about that thickness.

Q. In your opinion would this type of head be likely to hold indefinitely, a large button head? You explained from holding on the crown that one side or the other is not insulated all the time. Would you expect them to stay that way indefinitely; and, if not, when?

A. I would not, for the simple reason that there would be a gradual opening up more and more between the button head and the sheet until it got to be to such an extent that there would be an insulation of material almost around that head.

Q. And when it reached that stage?

A. It would be apt to overheat and weaken the head.

Q. And at that time would you expect the bolt to drop off?

A. Yes.

Q. About how long would you expect that operation to take?

A. As I said before, that would vary a great deal.

Q. Would you expect it to be pretty well along in a year or two years in constant use?

61 A. It might be a month and it might be two years.

Q. You give two years as a maximum?

A. I would not give anything as a maximum or minimum.

Q. Have you ever heard or read any literature or any reports of a button head in an oil burning engine burning off?

A. Not on an oil burning.

Q. That is purely theory and speculation on your part not borne out by any experiments of any kind?

A. I have seen authority on it on coal burning engines that had to be repaired and here with an oil-burning engine having a much hotter fire, it necessarily follows that they would burn off quicker with an oil burning engine?

Q. Would it surprise you to learn that there are button head bolts on other oil burning roads like the one shown here (ind.) that have been in use ten years and not replaced and never given way?

A. Yes, I think it would.

Q. Would it surprise you to learn that we have on the Great

Northern an engine with that type of head that has been in use five years and that no head came off?

A. Yes, it would.

Q. If these facts were demonstrated to you, would you admit that there was some flaw in your theory?

A. No. Not necessarily.

Q. Would you still prefer your theory?

A. That experiment would be a decided exception.

Q. If that proved to be the universal experience, proved that a button head had dropped off, would you then decide there was some flaw in your theory?

A. I do not think that is the universal experience.

Q. After this crystal-izing of material over the points of head itself, Mr. McGrath, so that the bolt got hot up to 1500 degrees every trip, just barely hold it, would you expect that to cause a deterioration in the middle of the bolt, so that it would deteriorate then when cold?

A. Yes, it probably would.

Q. It would have a tendency to occur, would it have a tendency to crystal-ize?

A. Not very much that I know of. I have seen experiments on that the results of experiments which didn't show much crystallization.

Q. Would you expect the metal to remain as good when cold as it was when it was new? That is take a bolt that had been in use. Q. *Would you expect the metal to remain as good when cold as it was when it was new? That is take a bolt that had been in use two or three years and, according to your theory, after the first month or two, it has been heated to 1500 degrees every day and then cooled off again every day? Now if you take that bolt out and test it cold, would you expect it to have all its old strength?*

A. No, hardly.

Q. Would you expect the grain or structure of the metal to be affected?

A. Yes, I think it would.

Q. If you could take a bolt out which has been used for five years, in actual use, with an oil burning engine and should test its pull and strength, also test it metal-ographically, and should find that it had retained its original strength and structure, would you conclude that your theory was wrong?

A. I don't know that I had any particular theory on that.

Q. Let me change it: If you should find that this test worked out all right, would you conclude that this opinion of yours in regard to crystallization there in the head of the bolt from overheating was erroneous? Would you not, in other words, conclude that the metal, being good and having all its old strength, it must have been protected by water and not crystallizing all the time?

A. It would deteriorate more or less any how.

Q. That is this crystallization?

A. With it or without it.

Q. You said after a period of five or six years?

A. Yes, five years.

Q. Would every bolt deteriorate, every type of bolt deteriorate?

A. Yes, it would, and the one with the larger head would deteriorate more because that is subject to being raised to a higher temperature.

Q. Then if you could take a bolt with the larger head that had been in use five years and test it and find its condition good and all its original strength, would you not conclude that it must have been protected from the fire and could not have had the scale around it?

A. Yes, it probably would.

Q. Would you be willing, at the expense of the Great Northern Railway Company, to call in one of its engines and designate, say five bolts that you think ought to have this scale in them, and which ought to show more or less of use, weakening, and have them removed and tested under your supervision for strength and also metallographically, and report to the jury what the results were? Would you be willing to have that done this evening?

Mr. Dorety: I will say to counsel that I would be glad to have that done.

Mr. McCabe: I suggest that you produce, so that the jury may have them, the 200 crown bolts and heads that were actually on engine 1902 when Vance Thoms met his death.

Mr. Dorety: We expect to produce these bolts, not only these bolts but tests made also, and of other bolts that have been in use even longer.

Mr. McCabe: Those on 1902.

Q. Then you would decline to have the tests made that I have suggested?

Mr. Zettler: I think this is merely taking up time.

The Court: You may proceed with the examination.

Q. Lest your testimony should mislead the jury, counsel asked you if these bolts showed the actual size of the bolts and you said "Yes". You mean in diameter not in length?

A. Yes. Not in length.

Q. The length would be the entire length of the paper?

A. Yes, and even larger.

Q. Now, you said that when steel is once raised to 1500 degrees there is a discoloration which is ever after observable, do I understand you?

A. Yes.

Q. As a matter of fact the steel is much hotter than that when it is put in?

A. Yes.

Q. What they call a flanging heat?

A. You mean when it is made?

Q. When it is put in the engine, not when it is working but when it is put in the engine?

A. Yes.

Q. Does that produce a discoloration that is ever after observable?

A. It is not observable from the fact that it is used immediately afterwards.

Q. The use then destroys the discoloration?

A. Yes.

65 Q. So that then in case of immediate use if the metal became discolored and not taken out and put away the discoloration would disappear?

A. More or less it would.

Q. Practically all of it?

A. Well, a flange is overheated in that way and worked afterwards it takes off the color which results by overheat.

Q. And this discoloration is simply a color effect on the surface?

A. I think that is what it is.

Q. And for that reason it goes off, it is no longer observable?

A. The burnt part might be observable from the fact that it would appear to leave a rough surface.

Q. But not a discoloration?

A. Not so much of discoloration.

Q. Is it possible to heat metal hot enough to sag, for instance, without its losing a considerable portion of its strength and not leave a rough surface?

A. I hardly think it would be.

Q. Take a horse shoe, for instance, that was heated by the blacksmith in order to pound it into shape, and you think by the heating it is left rough?

A. It is sometimes. You can see it has been heated.

Q. But there is no discoloration?

A. Yes, I think there is a discoloration.

Q. You are not quite sure?

A. It depends on whether it has been used or not.

Q. Now, you say you know of no reason why a fusible plug should not be used on a locomotive boiler? You know, as a matter of fact, do you not, that they are not used on locomotive engines except by one or two companies in the country?

A. I don't know how many companies use them.

Q. You know they are generally not used?

66 A. I think they are more or less in general use, or used to a great extent, at least.

Q. Don't you know that most railroad companies do not use them on locomotive boilers?

A. I don't know how extensively they are used.

Q. Or have abandoned them?

A. I don't think they have abandoned them.

Q. You know some companies have abandoned them?

A. Yes. I believe they have.

Q. Tried them out and found they didn't work and abandoned them?

A. I don't know about that.

Q. They are comparatively cheap things to install?

A. Yes.

Q. There could be no objection to the same on account of the expense of installing them?

A. No.

Q. And if they could be made to work at all the saving of one explosion would save the company more than they would spend in all their life in putting them in?

A. Yes.

Q. So you would conclude from that there must be some pretty good reason for not using them?

A. I should think the reason they are not using them is because it is not so very long since they adopted the oil burners and furnaces and they have transformed most of the old locomotives from coal burning to oil burning and have not made the change.

Q. It is ten years?

A. Some, but not all of them. In this case it was in 1912 it was changed.

Q. You do not have to get a new engine to put a new plug in it? You could put them in in a few minutes in any of them?

A. Yes.

67 Q. Now, assuming that there was at least four inches of water in the glass on this locomotive at all times prior to the explosion, would the presence or absence of a fusible plug make any possible difference in the explosion or could it have anything to do with the explosion?

A. If the crown sheet was covered with water the fusible plug ought not to work.

Q. You can say positively, can you, now as an expert that this explosion, if it occurred with four inches of water on the crown sheet was not due to the absence of a fusible plug, and with that much water on the crown sheet a dozen fusible plugs would not have any effect in preventing the explosion?

A. It would seem that way.

Q. In other words, the fusible plug theory can have nothing to do with this case, if there was four inches of water on the crown sheet?

A. I don't know all the circumstances.

Q. Would you think it had any bearing in this case under any of the circumstances?

A. Not that I can think of.

Q. You never saw one of these plugs yourself, you say?

A. No.

Q. Never took one out and examined it?

A. No, I did not.

Q. Mr. McGrath, what is this metalographic test you speak of?

A. It is a test made of metal.

Q. They use it in testing materials, in testing the sufficiency of materials used for various purposes?

A. Yes.

Q. It is made by polishing the surface of the metal and etching and taking photographs from the metal?

A. Yes.

68 Q. It would be possible, would it not, to test any of the 200 stay bolts which Mr. McCabe said were taken out of this engine 1902 and determine the state of the metal in them?

A. I think it would.

Mr. Dorety: We are willing, Mr. McCabe, to comply with your request, and produce these, and I will make the offer now to let Mr. McGrath, or any other expert you may mention, to take these bolts and make a metalographic test, or any other test you desire.

Mr. McCabe: We are perfectly satisfied that the jury inspect the bolt and the head of the bolt which we have here.

Mr. Dorety: I will make my offer to include bolts, heads of the bolts and everything we have.

Q. Mr. McGrath, this expansion that you have spoken of on the crown sheet when it is heated which makes a difference of half an inch in its length and causes these bolts to lag, as it were, on the heads, that same expansion would exist where the No. 3 type was used?

A. Yes.

Q. Wouldn't that almost immediately loosen the threads and make the bolt leak?

A. No, I don't think it would.

Q. You think that would lag back for an inch and still not leak at all?

A. That is approximate.

Q. It is considerably less?

A. I don't think it is.

Q. In giving the estimate of 700 degrees of this crown, that movement would sufficiently burn the sheet away from this bolt or open the head of the bolt away from the sheet in that distance, which is about the thickness of a bolt, wouldn't it also be sufficient to loosen these threads and break them?

A. It would have a tendency to loosen them.

69 Q. You would expect them to leak very quickly?

A. I would expect them to leak.

Q. As a matter of fact, with that No. 3 type of bolt they do not have trouble with leaking very much?

A. No.

Q. Have bolts in there for years that do not leak?

A. Yes.

Q. And the same is true of the No. 1 type of bolt?

A. No, it is not so true.

Q. It is true in some cases?

A. Yes, in some cases.

Q. Isn't it a fact that that expansion would work in both directions from the center, that the center bolts would be in one place?

A. But the sheet would expand a little bit towards the front and towards the back from the center. It would expand over to the sides.

Q. It is a fact that the back is pretty well braced with the boiler itself? Isn't the front part fully braced by the flues?

A. There is the lever room of 3 or 4 inches on the front plate or the front sheet.

Q. Isn't it a fact that one reason why the four front rows of crown bolts are hung on stays—they use a different type of bolt here than they do in the back part of the boiler—for the very purpose of taking care of whatever expansion there may be?

A. Yes.

Q. So that these four rows, at least, of bolts ought to stay close up against the sheet?

A. That would be more apt to be true than the rest of the bolts.

Q. If they used this type of bolt on this type of engine they would avoid this trouble altogether?

70 A. To a very great extent.

Q. Wouldn't they altogether?

A. I don't know whether they would altogether; I don't believe that would be borne out by experience.

Q. Not borne out by experience because you never heard of a railroad company that did that?

A. They hang them on that other kind of a hanger.

Q. You never heard of a boiler being constructed with these bolts on the back part of the crown sheet?

A. I heard of them on the old types of boilers.

Q. Discarded now?

A. Yes.

Q. There is a good deal of expansion in these flues too, isn't there?

A. Yes.

Q. Wouldn't you say that this sheet coming out half an inch and pushing the flue sheet forward and the flues themselves shoving out in the opposite direction, that the tendency would be to push the flues backward and the sheet through which they pass forward and cause them to leak.

A. There is that tendency, but the tendency is for the expansion of the flues to a little bit more than counteract the comparative strain and set up a leak, making the expansion on the crown sheet less, being sufficient to push the flue sheet away from the flues and make them leak.

Q. That is assuming there is as much heat as you are assuming there is?

A. It doesn't change it.

Q. How much expansion would there be at 400 degrees?

A. What are the conditions? Expansion of what?

Q. If the crown sheet were heated to 400 degrees how much expansion would there be?

71 A. What temperature?

Q. From 360 to 380 degrees, the temperature of the water?

A. Is that crown sheet about 8 feet long?

Q. 95 inches.

A. That is about 19/100 of an inch.

Q. About 1/7 of an inch?

A. Yes.

Q. That would be about what the expansion would be on the upper surface?

A. Yes.

Q. You could not get an expansion of half an inch on the lower surface?

A. There would be a stress set up, an internal stress set up, in the sheet to take care of that.

Q. Tell the jury what that means. This part of the plate would move over $1\frac{7}{8}$ and this part $1\frac{1}{2}$?

A. I say the upper part of the plate tends to move over $1\frac{5}{8}$ and the lower part $1\frac{1}{2}$, and the result would be about the average between the two, about $35\frac{1}{100}$.

72 J. C. PIERRON, called as a witness by the plaintiff, sworn and testified as follows:

Direct examination.

Mr. Zettler:

Q. What is your occupation?

A. I am working in the capacity of boiler maker.

Q. How long have you been a boiler maker, Mr. Pierron?

A. Some thirty years or more.

Q. Have you worked for railroads in that capacity?

— Yes, sir.

Q. Give the names of some of the railroads you have worked for?

A. The Chicago & Northwestern, Great Northern, Rio Grande & Western, Chicago, Milwaukee & St. Louis and Wisconsin Central.

Q. Mr. Pierron, were you present at an inspection of the crown bolts and crown heads that came from defendant's engine No. 1902, which inspection was had about April 24, 1914?

A. Yes, sir.

Q. Who was present during that inspection?

A. There were four or five officials of the Great Northern Railroad Company.

Q. Did you during that examination personally inspect and examine these crown bolts and heads?

A. Yes, sir.

Q. Will you, Mr. Pierron, come down and look at this drawing and take that pointer?

(Witness leaves witness chair.)

Q. Referring now to that part of Plaintiff's Exhibit A which is marked 1, I will ask you if that is the type of crown bolt which you examined from that engine?

A. Yes, sir.

73 Q. Now, I will ask you from your experience, from your thirty years' experience and your study in using this kind of a crown bolt with the head that is indicated there, in an

oil burning engine, such as engine No. 1902, what effect, if any, has the oil flame on that sort of a bolt, of that size?

A. Well, naturally it would seem to crystallize and overheat with so much head in the fire.

Q. What is the final result of this overheat?

A. Well, it gets crystallized; loses its strength.

Q. And then what results?

A. It is liable to—the crown sheet comes down.

Q. And what happens, Mr. Pierron, when the crown sheet comes down?

A. People get scalded.

Q. Referring now to Figure 3, the other crown bolt marked on plaintiff's Exhibit A, I will now ask if the oil heat in an oil burning engine would have the same effect on a crown bolt head that is constructed in the manner there shown, substantially?

A. No, it would not.

Q. In your practical experience have you ever had as a boiler maker for the various railroads, have you ever seen used a head as large in material as the one in Figure 1 on Plaintiff's Exhibit A?

A. I have not.

Q. What has been your experience on railroads, referring now to the drawing, what kind of heads is used in oil burning engines?

A. The head with the ordinary stay bolt, the button being like No. 3.

Q. Have you ever known of cases where coal burning engines were changed to oil burning engines?

A. Yes, sir.

Q. In your experience when coal burning engines were changed to oil burning engines, was it or was it not the fact that the crown bolt heads, these heads as shown on Figure 1 and Figure 3, were changed?

Mr. Dorety: We object to the question on the ground it is immaterial, irrelevant and incompetent.

The Court: It will be overruled. Exception saved.

A. With a little bolt head I have never seen that bolt head changed. They have a bolt that goes through the sheet with a nut and reinforced, and they always further have to allow about three threads the same as placed in the side sheet.

Q. And what does that approximately represent on the drawing?

A. No, 3 is the bolt.

Q. Are you familiar with the use of safety fusible plugs in locomotive crown sheets?

A. Yes, sir.

Q. Will you explain to the jury the nature and purpose of safety fusible plugs in crown sheets of boiler locomotives?

Mr. Dorety: I object to the question on the ground it is incompetent, irrelevant and immaterial, and so shown by the testimony submitted by the plaintiff. This contention is raised by the evidence in this case, that there was water on the crown sheet of this locomotive

when it exploded. The testimony of the plaintiff's witness is that the presence or absence of a fusible plug would have nothing to do with it.

The Court: In other words, the two theories are materially inconsistent. Overruled. Exception saved.

Mr. Dorety: I move to require the plaintiff to elect on which of these two theories they are going to proceed.

The Court: That will be denied. Exception taken.

Q. Now, Mr. Pierron, will you go ahead and answer the question I have asked?

75 A. A fusible plug is placed in the crown sheet; it is placed for safety to notify them in case of low water. A plug can be made from the interior or from the fire box sheet but, as a rule, it would be put from the exterior part of the boiler, and it is flush with the sheet of the fire box; and it is filled with a composition of lead and zinc—lead wouldn't be hardly used in an oil burning engine—they would make the composition to stand some heat; and when the crown sheet would be bare the fusible plug would melt; this lead would run out and notify them that the water is off the crown sheet.

Q. In reference to explosions what are their use?

A. That is to notify them of low water.

Q. Now, I will ask you this question, Mr. Pierron, in your experience has it or has it not been the custom of ordinarily prudent railroad companies to use the safety fusible plugs in their locomotive crown sheets to prevent explosions?

A. Yes, sir.

Mr. Dorety: I object to that.

(Argument.)

The Court: That is sustained. I think, as the supreme court said there, it may be material to inquire whether or not bolts of the type of No. 3, shown upon the exhibit here, are used by other railroads in the construction of their boilers, but I do not think it is competent to ask of this witness if they are used by other railroads that use ordinary care. That would be asking this witness to give his conclusion.

Mr. Zettler: I think the court is right so I will withdraw the question and ask it again.

Q. Mr. Pierron, in your experience with railroad companies has it been the custom of railroad companies in the situation that the defendant is, to use the safety fusible plugs in their locomotive crown sheets to avoid explosions?

Mr. Dorety: Same objection.

The Court: Overruled. Exception noted.

76 Q. State whether or not it is the custom?

A. To answer that question I cannot say that all roads use them. The majority of them do, the majority of the roads I worked on.

Q. You said in your testimony that you inspected the bolt heads and bolts from this engine No. 1902?

A. Yes.

Q. Let me ask you this: If the engineer of that engine had allowed the crown sheet and the bolts to become bare of water, what effect would it have on the crown sheet and the bolts? What effect would the fact that the engineer had allowed the water to become bare on the crown sheet have on the crown sheet?

A. It would melt if they didn't put water on it, and after they put water on it it would explode.

Q. Would there be a discoloration?

A. Certainly there would.

Q. Would it be a permanent discoloration such as would be observable?

A. Yes, you will observe it.

Q. In your examination of that crown sheet did you notice some of the discoloration?

A. In some of the bolt holes.

Q. I mean in the crown sheet?

A. In some of the crown sheet holes.

Q. Would that be caused by low water?

A. Not necessarily.

Q. But, as I understand you, there would be a discoloration on the crown sheet if the water had been allowed to get too low?

A. Yes.

Q. Did you observe such a discoloration?

A. No.

Q. You say that parts of the threads—What was that you said about some discoloration?

77 A. In the crown sheet in the thread in some of the bolt holes it was some discoloration taken place.

Q. What part?

A. The place where it came down the lowest.

Q. Just come down here and indicate with the pointer just about where that was.

A. Back down about here. Right in here (ind.).

Q. That represents the higher part of the crown sheet. About how many rows would that be?

A. It would start in about the sixth or seventh row in here somewhere (ind.). I have not figured how many stay bolts there was on that class of engine.

Q. In your opinion from your experience by what was this particular sort of overheat caused?

A. The only thing I can account for it is in the bolt heads, and there may have been some scale on the top of the crown heads.

Q. Can you think of any other cause than scale considering the place where that discoloration was?

A. No, I cannot.

Q. Let me ask you this question: In your experience has it been the custom of railroad companies such as the defendant to

allow scale to form in such quantities as would cause this sort of overheating that you observed?

Mr. Dorety: Same objection.

The Court: Same ruling. Exception noted.

A. No, not if you can possibly avoid it.

Q. Can it be avoided?

A. Yes.

Q. How?

A. Well, in order to get the scale thoroughly off you must remove all the bolts.

Q. Is there any practice or method of washing or just
78 washing the boiler?

A. Just washing the boiler, ordinary washing.

Q. Would that washing have the effect of preventing scale to such an extent that you observe it?

A. They might if they washed it long enough.

Q. What effect has the collection of scale around the bolt heads or bolts upon the effectiveness of the bolt heads to retain heat?

A. Why it keeps the water from coming in direct contact with the metal itself. The fire has some action on the substance.

Q. (By juror.) The substance?

A. The substance of the material of the bolt.

Mr. Zettler: If any juror has a question we would like to have it.

The Court: If any juror has a proper question he will indicate it to the court.

Q. Assuming, Mr. Pierron, that engine No. 1902 was coming up a grade of approximately 2.2 per cent, what part of the crown sheet would become bare first if the water went down?

A. The highest point of the flue sheet.

Q. I mean on the crown sheet?

A. The crown sheet at the flue sheet.

Q. Just come down and indicate where it is.

A. (Witness indicates with pointer on Exhibit A.) Right over here (ind.) is the highest point.

Q. Where would the first coloration be?

A. No, it would show a coloration there at the highest point.

Q. Did you see such discoloration?

A. No.

Cross-examination.

Mr. Dorety:

Q. By whom are you employed at the present time?

A. I am employed by the government.

79 Q. Where?

A. Over at the Navy Yard, Bremerton.

Q. How long is it since you have worked for a railroad?

A. About nine months.

Q. What company were you last employed by?

A. The Chicago, Milwaukee & St. Paul.

Q. That company doesn't use fusible plugs, does it?

A. It does in some engines, yes.

Q. It does not on the oil burning engines on this coast?

A. They had them in and removed them.

Q. Had them in and discarded them?

A. They took them out.

Q. Found they didn't work right?

A. (No answer.)

Q. Found they didn't work very satisfactory?

A. I don't know.

Q. How long had you worked for the Milwaukee?

A. About two and a half years.

Q. What company were you working for before that?

A. I was working at the navy yard.

Q. What was the last railroad company you worked for before the Milwaukee?

A. The Rio Grande & Western.

Q. They do not burn oil?

A. Not at the time I worked for them.

Q. What other road have you worked for that burns oil?

A. Not only one, the Chicago, Milwaukee & St. Paul, they burn oil.

Q. When you say it is the custom on roads for whom you have worked, burning oil, to use fusible plugs, that is based on the fact that the Milwaukee used to use them and discarded them?

A. They have them on some of their engines today.

Q. But not on most of them?

80 A. Not on most of them, no.

Q. When you say it has been the custom on oil burning roads to use the No. 3 type of bolt, how many of the roads you have worked for, burning oil, use that No. 3 type of bolt? That means all the roads?

A. The Milwaukee.

Q. That is one.

A. I am acquainted with two other roads that use that; the other doesn't. The Chicago, Milwaukee & St. Paul is the only one that burns it.

Q. That is one out of one so it is a majority?

A. One man might work for the company for years.

Q. The Southern Pacific has also oil burning engines with button head bolts?

A. I never seen any only from hearsay from their boiler makers that I know—not direct.

Q. You are giving testimony under oath, not from what you have heard.

A. A person generally gains their information from talking with others.

Mr. Dorety: I make a motion to strike the witness' testimony as given, his testimony as to the use of button head bolts on other oil burning roads.

(By Mr. Zettler:)

Q. May I ask if there are a great many oil burning roads in this country?

A. Not a great many.

(By Mr. Zettler:)

Q. From your knowledge of oil burning roads you would say that your answer is correct?

A. Yes.

Mr. Dorety: He has said that the only road he ever worked for is the Milwaukee burning oil.

A. I worked for the Northern Pacific and they burn oil.

81 Q. They have button heads too?

A. I have not seen them on the roads on the engines I worked on.

Q. Don't you know they have some?

A. I don't know. I worked at the round house at Tacoma for about a month and a half.

Q. When was that?

A. Here before I went to the navy yard.

Q. When was that?

A. A little over nine months ago.

Q. Was that about three years ago?

A. Nine months ago. A little over nine months ago.

Q. What percentage of the Northern Pacific engines were burning oil at that time?

A. I didn't figure that; I had not been there long enough. Over half of them.

Q. Their coal burning engines, they had them?

A. Yes.

Q. You say you never saw any other oil burning engines with the button heads?

A. No.

(By Mr. Zettler:)

Q. By button head you mean 1?

A. Yes.

Q. You mean any head that is made when the bolt is made and not riveted through after it is put in?

A. I don't mean any surplus metal in the bolt.

Q. When you speak of a button head—

A. A button head is a bolt that—

Q. Which has a round head?

A. They might put them in with that square and use a different bolt to put them in; they do not use the same metal.

Q. It might have different amount of metal in the head and still be a button head?

82 A. Yes, it might have a less amount of metal and still be a button head.

Q. Or more?

A. Yes.

Q. Then your experience, your testimony has reference to the Northern Pacific on which you worked for a month and a half and which had a very small percentage of engines in oil—Just trying them out were they not?

A. I don't know. I didn't inquire as to how they worked there at all.

Q. It represents that experience on the Northern Pacific and the Milwaukee, and no more?

A. I don't hear very well. You will have to talk a little louder. (Question repeated by stenographer.)

A. Yes, that is all the experience I had with oil burners.

Q. You didn't find fusible plugs on the Northern Pacific?

A. I never noticed.

Q. You know they don't use them?

A. I wouldn't swear to that.

Q. That is your impression?

A. I didn't see them use them.

Q. This inspection that you made on the crown sheet and bolts, that was made with Mr. McCabe and some other boiler maker from Bremerton?

A. It was made with Mr. McCabe and four or five officials of the Great Northern.

Q. Was Mr. Kelly present?

A. Yes, and Mr. Howie.

Q. He showed you the sheets and bolts in order that you might inspect them so you could testify in this case?

A. Yes.

Q. You state that on account of the large amount of metal in this button head it would become crystalized? Do you take any stock in this insulation theory of Mr. McGrath's?

A. I don't understand it.

Q. He said that when the engine got hot the head of the bolt would separate from the crown sheet a little bit and let gas in there.

A. No, I have never had any time to fathom out those things. I would not surmise at all.

Q. Isn't it recognized among boiler makers that the fact is just the contrary, that when the head is hot it expands and presses up against the sheet, that when the water is hot it presses the sheet down against the head of the bolt, and that the most unlikely time to have any scale or insulation between them is when it is hot?

A. Yes.

Q. And that is just the time when the scale will not get in and not as Mr. McGrath says it is the time it will get in?

A. This expansion and contraction, when they cool they contract.

Q. You will often find a bolt leaking and heat it up and it will swell up and stop the leak?

A. Not always.

Q. But you will often find it?

A. Sometimes, yes, sir.

Q. And that illustrates what is the fact that when you heat your

engine the bolt head of your bolt comes up close to the sheet?

A. The bolt don't get—the metal probably comes in contact.

Q. What I mean is they are close together and there is no space?

A. A little closer.

Q. That scale forming theory is not recognized among practical men?

A. I don't know anything about it.

Q. Now, your theory is that the heads become crystalized?

84 A. They do in any kind of material that is used in boiler works very much; it becomes crystalized.

Q. Would that crystalization extend in the portion of the bolt where the thread part joins the head so that that metal in there would be weak?

A. It would surely crystalize up in the bolt.

Q. Do you know what a metalographic test is?

A. No.

Q. Have you ever heard of etching metal to determine its condition?

A. No, I have not.

Q. Do you know of any test that you could make of a bolt of that character which, according to your theory, would be crystalized? Do you know of any test to determine whether it is crystalized?

A. A person that has had experience can tell a piece of steel that has been crystalized. They generally have such in boilers, they ought to be renewed every year.

Q. About how long would you say it would take them to become crystalized?

A. In about a year to any extent.

Q. Would you expect it to become so weak that the head would drop off under pressure?

A. Not necessarily, because they find the crystalized would probably stand as much strain as when new. Tests have been made to show they have got to expect deterioration. They would pull out may be.

Q. How can you explain this sheet dropping as it did drop down here and these heads pull off if they have the same strength when crystalized or not crystalized?

A. Because they were hot.

Q. Your idea is that the metal itself was practically fused?

85 A. Practically fused; overheated.

Q. When metal is fused its fiber is destroyed?

A. Yes.

Q. You know that it is a fact that when this type of bolt is used this square head is usually broken off when it is put in?

A. What is that?

Q. You know that it is a fact that when bolts of this type are used this little square head on them is broken off or taken off after the bolt is put in place?

A. Not always.

Q. Do you know what the custom is on the Great Northern?

A. No, I do not.

Q. Would that have anything to do with your testimony?

A. What?

Q. Suppose that it were broken off would it affect your opinion in any way?

A. Not a bit.

Q. If you found a head of this type such as we have in No. 1 which had been in use five years and took it and broke it in two or cut it in two and found the metal on the inside as good as it ever was, would that affect your opinion?

A. No.

Q. You say it crystalized, if you opened it and found it was not crystalized would that change your mind?

A. In five years?

Q. If it had been in service five years?

A. They would have to prove to me they would have to be in there five years. I have taken out a good many bolts, hundreds and hundreds of them; I have tried them, worked on them, and a high speed drill wouldn't touch them.

Q. If that was proven to your satisfaction, would it?

A. It would not run for five years without being crystalized. You might take them out and anneal them and they would not
86 show it.

Q. Can you tell with a hammer and chisel whether they have been crystalized or not?

Q. Yes, sir.

Q. Would you be willing to go out to the Great Northern shops this afternoon or evening and take an oil burning engine of this class, select the engine, and select the bolts, and take a chisel and hammer and test them in that way and report to the jury what you find in the morning?

Mr. Zettler: It seems to me that is collateral.

The Court: It seems to me it is outside the examination. I don't think that is competent cross-examination. Objection sustained. Exception noted

Q. Could you tell with a chisel and hammer from the bolts which Mr. McCabe has in his possession which came off this particular engine whether or not they are crystalized?

A. You can see they are.

Q. Have you tried them with a chisel and hammer?

A. I have not tried them. I could tell.

(By Mr. Zettler:)

Q. Have you already examined them?

A. Yes, but I have not touched them with a hammer. It is not necessary, the crystalization, that caused them to come down and then the heat on the bolt head caused them to fail.

Q. Either was a cause, one is the crystalization and one is the heat?

A. I was assuming that the bolts would be crystalized any time any of them failed.

Q. Are you making any deduction that the bolts on this engine were crystalized or not?

A. I would not swear they were crystalized: they have been overheated and the water come in contact with them.

87 Q. Then you don't want the jury to understand that the bolts or the heads had been permanently weakened in any manner—I mean the metal in them—especially from the fact they were hot?

Q. They generally get weakened on account of expansion and contraction all the while the bolt head itself is in the heat, and it is that way weakened and caked up, filled up where they had been leaking.

Q. Is it or is it not your wish to be understood by the jury that it is your opinion that the bolts which came off this engine and which you have seen were crystalized or the bolt heads?

A. They were overheated.

Q. Is the metal good or isn't it?

A. I want to be understood that they were both ways; they are crystalized and overheated, both ways.

Q. Is all above in the head good now or isn't it?

A. No, it is not.

Q. Would you be willing to take a chisel and hammer and try these heads and tell the jury?

A. Yes, I would with a chisel and hammer.

Mr. Dorety: I would ask him to do it.

Mr. Zettler: I object to that as foreign to this trial.

The Court: I don't think it is competent. If you want to make this witness your witness you may have him make any test you desire.

Exception noted.

Q. Now, aside from this crystalization proposition, aside from the fact that the metal in the bolts is spoiled, I understand that you claim that the metal in the bolts was red hot and gave way on that account?

A. Naturally they were.

Q. But the sheet was not?

88 A. In an oil burning furnace, the heat could get against that bolt head without any apparent effect on the sheet.

Q. Is it your opinion or is it not that the sheet was not?

A. It only showed it in the bolt holes.

Q. How big a space?

A. Six or seven rows from the outer side and extending to about the eleventh.

Q. About four rows of bolts?

A. It is about six or seven rows from the outer sheet, the flue sheet. I don't know how that is constructed.

Q. It is your opinion that that part of the sheet was red hot?

A. No, the sheet naturally—

Q. That part of the sheet?

A. The bolts were red hot.

Q. Was the sheet red hot or was it not?

A. No, it could not have been hot like the bolts.

Q. Was it red hot?

A. No.

Q. But the bolt heads were?

A. Yes.

Q. Is it your opinion that every time an engine goes out on the road with a bolt head like that that it gets red hot?

A. Yes, they get red hot.

Q. In other words up to 1,500 degrees?

A. I don't know what degrees. I have not studied up. I know there is quite a good many degrees of heat. There is about twice as many of heat—

Q. Do they get hot enough to lose all their strength?

A. Yes, they surely would. I am not so sure—The oil may be regulated right. You can burn a fire with oil and get more heat if you regulate it.

Q. Then, is it possible to run an engine with this type of bolt without any trouble—No. 1?

A. They have used them; they leak out. I have handled
89 them many a time and calked them up.

Q. Is it possible to run an engine with the type of head like the No. 1 bolt here without getting it red hot with an oil burner?

A. No, I don't think you could.

Q. Now, isn't it your opinion that every time an engine with that type goes out on the road the bolts get red hot?

A. They naturally do, yes, sir.

Q. And when they are red hot they are hot enough so that they have lost practically all their strength?

A. Not unless they get to almost a white heat. If the heat don't extend up in the bolt.

Q. Has it lost any of its strength?

A. Yes, it has lost some of its strength.

Q. Have you ever heard of engines with that type of bolts running for ten years—with No. 1 bolt?

A. I probably have a coal burner.

Q. Not an oil?

A. No, I never have.

Q. Don't you know the Santa Fe has some?

A. I know they changed all their engines and used an ordinary stay bolt and drilled the head off.

Q. You mean to say that the Southern Pacific has no bolts like that?

A. I never worked on the Southern Pacific.

Q. You know that the Great Northern used bolts like that for five years?

A. I would not swear to that. I don't know anything about it.

Q. Outside of this case have you ever heard of a crown sheet dropping down by reason of using bolts like that?

A. Yes, I have seen crown sheets down.

Q. Where?

90 A. I seen one on the Great Northern, and I seen one on the Northern Pacific and I saw one on the Milwaukee.

Q. I thought you never saw that character of bolts except on the Great Northern?

A. I saw the head bolts but not on the oil burners.

Q. Then in your opinion it is just as bad to use these bolts on coal burners as oil burners?

A. No, sir.

Q. Is this your opinion, that the use of these heads on coal burners is likely to cause the crown sheet to drop?

A. That bolt on a coal burner has more strength than other bolts, more surface, more material.

Q. It is a better bolt to use on a coal burner than the No. 3?

A. Yes.

Q. On a coal burner now you would approve the use of No. 1 with the large head?

A. There is all kinds of bolts one would recommend.

Q. But between No. 1 and No. 3 you would approve the use of No. 1 on the coal burning engine?

A. Yes, on most of them they have to reduce them, cut them away.

Q. Other bolts are hammered up like?

A. Yes, those with the hammered head.

Q. The metal is where the fire is hottest?

A. Yes, towards the flue sheet.

Q. And they use the No. 1 with the large head on coal burners on that portion where the fire is the hottest?

A. They use a sling stay. On some they have three rows back and some one.

Q. On coal burning engines in that part of the crown sheet where the fire is the hottest, all roads use those with the large head?

A. Yes.

91 Q. It is the universal practice?

A. Yes.

Q. Did you hear Mr. McGrath's testimony on that?

A. No.

Q. You know this, that it has been proven by experience that the No. 1 on the coal burning engine has been shown better by experience?

A. It is better in one way.

Q. How long would the discoloration which comes on the crown sheet from heat last?

A. How is that?

Q. You spoke of this discoloration from heat that comes on the sheet of steel, how long would that last?

A. Last until it was worn off, off the outside.

Q. It is a sort of scale that forms?

A. The same as you describe, it is all steel.

Q. As a matter of fact the crown sheet is heated into a flange when it is put in place?

A. What?

Q. They heat the crown sheet hot enough to scale it when they put it in the engine?

A. It depends on what style of crown sheet they put in.

Q. Do you know what type of crown sheet they used on the 1902?

A. What they call the Beupree crown sheet.

Q. They heat it?

A. They heat the outside to a flange heat.

Q. Heat it enough to discolor it?

A. Yes.

Q. Is that discoloration there now?

A. No.

Q. That disappears?

A. Yes, sir.

92 Q. And that discoloration is the same sort of discoloration that would come if this explosion were due to low water?

A. Yes.

Q. Would disappear after a while?

A. Disappear after it was worked.

(By Mr. Zettler:)

Q. If it were used?

A. Yes.

(By Mr. Zettler:)

Q. Not if it were not used?

A. Unless they worked it away.

(By Mr. Dorety:)

Q. Now it is a fact is it not, Mr. Pierron, an explosion on a locomotive can be caused by low water and as a result of low water if the water is low enough and the fire hot enough with any type of bolt?

A. Yes.

Q. And at least, on a coal burning engine it would explode sooner with a No. 3 than with a No. 1 bolt, wouldn't it?

A. Yes.

Q. Because the head of the No. 1 gives a certain support to the sheet?

A. With low water the crown sheet and all would be hot.

Q. But it would pull through quicker on the No. 3 than the No. 1?

A. Yes.

Q. This low water is something that can be prevented by the engineer if he is careful, is it not?

A. All things can be prevented if they use carefulness about everything.

Q. You said that the forming of scale can be prevented by washing the sheet, railroad companies usually scrape their sheets do they not occasionally?

A. They pretend to scrape them. It is a pretty hard matter to scrape a crown sheet with these stays in there.

Q. It is not customary with other companies to give them
93 a thorough scraping?

A. They pretend to do it thorough, but from my experience I don't think they can possibly get it all off without taking the stays all out.

Q. They run a light in there between the bolts and then have a long scraper?

A. They can't get all through.

Q. That is the way they do it?

A. Yes.

Q. They scrape from both sides?

A. Yes.

Q. And sometimes get in from the front in on the boiler?

A. Get in there when the flues are out or through the dome.

Q. Now when the flue sheet is taken out, supposing it is taken out, that gives pretty good access to scrape the crown sheet?

A. Yes, you can scrape a certain amount of it.

Q. You can do a pretty fair job?

A. Yes.

Q. Especially from the front end?

A. Yes.

Q. If, as a matter of fact, this flue sheet had been out of this engine and the sheet scraped by a competent boiler maker in May, been washed out every thirty days from May to November, that was giving it pretty good attention?

A. Yes, supposed to be.

Q. Now, getting back to the sheet itself, you say that was not red hot?

A. What?

Q. You say the crown sheet itself was not red hot when it gave way?

A. That side was hot where the bolts were, the bolts had a tendency to carry the heat with them. When the bolts get
94 about red hot they will carry heat with them to a certain extent and discolor these holes.

Q. The reason why the sheet was not red hot was that there was water on top of it?

A. There must have been water on the crown sheet.

Q. Will a crown sheet which has water on top of it sag between the bolts?

A. It will from dirt; there may be scale and stuff.

Q. Supposing there is no scale?

A. It would not sag then; they bulge at high pressure.

Q. Cold?

A. They have when cold, yes.

Q. You want to say that a crown sheet will bulge and sag at the temperature of steam?

A. Bulge and sag between the bolts.

Q. And take a permanent set? I mean stay bulged?

A. They bag down between the bolts.

Q. Even though it is not red hot?

A. The crown sheet gets pretty hot.

Q. If you look in the fire box on the ordinary engine do you find they take a sag between bolts?

A. In the ordinary engine?

Q. Yes?

A. I worked on the Rio Grande and they were.

Q. If you get on the ordinary engine on this coast, the Great Northern, Northern Pacific, Milwaukee, or any of them, do you find the crown sheet sagged between bolts or don't you?

A. Sometimes.

Q. Very seldom?

A. I seen quite a few of them sagged on the Milwaukee.

Q. Does the crown sheet on the ordinary engine look like it sagged?

A. The stay bolts are all spaced.

Q. I mean bagged between the four bolts?

95 A. Not all of them. They generally form an accumulation of scale.

Q. If you get on the ordinary engine how many sags would you expect to find?

A. It depends on how long the engine had been in service.

Q. A couple of years?

A. I would not say how many bags would be in it; the sheet would not be very true.

Q. You would expect to find some portion on any of them?

A. Yes.

Redirect examination.

Q. Mr. Pierron, in your opinion, based upon your experience, would you still adhere to the opinion you expressed upon direct examination notwithstanding the questions that have been asked and the answers you have given?

Mr. Dorety: I object.

The Court: I will sustain the objection. Exception noted.

Q. Will you step down to the drawing, please?

(Witness steps down to drawing.)

Q. You are still of the opinion from your experience, Mr. Pierron, that the crown bolt head, as shown in Figure 1 of Plaintiff's Exhibit A, if used on an oil burning flame, would be excessively large and cause explosions?

Mr. Dorety: I object as not proper re-direct examination. It is exactly the same question he asked originally.

The Court: I will sustain the objection. Exception saved.

(Witness excused.)

96 Mrs. ADALINE DONALDSON, the plaintiff, called as a witness in her own behalf, being first duly sworn, testified as follows:

Direct examination:

Mr. Zettler:

Q. Mrs. Donaldson, you are the plaintiff in this case?

A. Yes.

Q. Are you administratrix of the estate of Vance H. Thoms, deceased?

A. Yes, sir.

Q. Mrs. Donaldson, what was your son's age at the time of his death?

A. Thirty years.

Mr. Zettler: At this time I desire to offer in evidence that portion of the American & English Encyclopedia of law, contained in Volume 20, page 885, 2nd Edition, the table showing the life expectancy at the age of thirty is 35.33. I presume there will be no objection, and as to the fact I will read it if satisfactory or put the book in evidence.

Mr. Dorety: No objection.

The Court: It may be received.

Mr. Zettler: 35.33 years.

Q. Mrs. Donaldson, what was the condition of your son's Vance H. Thoms' health?

A. Good.

Q. State whether or not he worked steadily?

A. Yes, sir.

Q. State, if you know, at the time of his death, about what he was earning per month?

A. \$175.00 to \$200.00 per month.

Q. Was Vance ever married?

A. No, sir.

97 Q. Is his father now living?

A. No, sir.

Q. How long has he been dead?

A. Since he was just a small child.

Q. Mrs. Donaldson, when did you come to the state of Washington?

A. Three years ago last month.

Q. Who brought you out?

A. Vance.

Q. Since you have been in this state did Vance live with you?

A. Yes, sir.

Q. Did he contribute to your support?

A. Yes, sir.

Q. Other than the support of Vance and your own efforts did you have any other means of support?

A. No, sir.

Q. Just prior to his death about how much approximately did Vance give you for your support?

A. \$75.00.

Q. Each month?

A. Yes, sir.

Q. Approximately on the average?

A. Up to his death.

Q. Did Vance ever say to you his intention of continuing to support you in the future?

A. Yes, sir.

Q. Just what were his declarations?

A. Well, in the first place, he said I had worked long enough——

Mr. Dorety: Same objection.

The Court: Overruled. Exception noted.

A. —and in the second place he was planning for a lot for us to build on; and in the third place we had planned to go East; and in the next place, he had planned for us to go to the Panama Fair next year. He said I worked enough years.

Cross-examination.

Mr. Dorety:

Q. Will you just tell the jury what your house arrangements were, Mrs. Donaldson? You rented the house or kept a house for Vance and he lived with you?

A. Yes, sir, we had rented a house.

Q. You had rented a house and you did all the housework yourself, did you?

A. Yes, sir.

Q. Was this \$75 a month which he paid you for your own use or for the general household supplies?

A. I used it just as I wanted to.

Q. What I mean is, did you use that to pay the grocer and the butcher and all the different household bills for the family?

A. It never made any difference what I used it for.

Q. I beg pardon?

A. I used it as I wanted to.

Q. Did Vance pay these bills in addition to this \$75.00 a month?

A. He paid some of the bills too.

Q. How much of them?

A. I could not tell you. He would go out and pay some. I never kept an account of what he paid. Sometimes he would go out and get things and fetch them in. He would get things for me.

Q. Did you ordinarily pay the rent, and the grocer and the butcher out of your \$75.00?

A. Not always.

Q. Did you generally?

A. No, as a general thing he paid the rent.

Q. Did you save quite an amount out of the \$75.00 or did most of it go in household expenses?

A. I didn't save much of it.

99 Q. It practically amounted to your having your home and living provided for you then and your doing the housekeeping?

A. I don't just understand the question.

Q. I mean to get at this, at the end of a year say you would have had your living and your home and you would have done the house work, and that is about the way you would stand, you would not have been able to save any very large amount out of this money? What I want to know is whether it was arranged so you were getting your home and living for your care of the home or whether you were getting more than that?

A. He was giving me my money and he was keeping up what I could not besides.

Q. Whenever the \$75.00 was insufficient to run the house he would pay the amount necessary?

A. Yes.

(Witness excused.)

Mrs. URSULA LITTLE, called as a witness by the plaintiff, being first duly sworn, testified as follows:

Direct examination.

Mr. Zettler:

Q. Mrs. Little, did you know the deceased, Vance H. Thomas?

A. Yes, sir.

Q. And you know his mother?

A. Yes.

Q. How long have you known her?

A. I have known him several years and have known his mother ever since she came here.

Q. Have you ever visited at their home?

A. Yes, sir.

100 Q. From your knowledge of their home life, do you know whether or not Vance Thoms supported his mother?

A. From what I could see and understand he did.

Q. Do you know of his habits?

A. He was moral in every way. He never smoked nor drank.

Q. And do you know of his habits as to saving?

A. He always seemed to be a very saving boy and very industrious.

Q. During the life of Vance did he ever say to you his intention of continuing to support his mother?

A. Yes.

Q. Just what declaration did he make?

Mr. Dorety: Same objection.

The Court: Same ruling. Exception noted.

A. He has made the remark to me that he never would marry as long as his mother lived.

(Witness excused.)

Mr. Dorety: I don't know whether Mr. McCabe meant to make a request for us to produce these two hundred bolts in the court room. Did you mean that as a request? I will say you may select any of them you desire; they are down at the shop, but we didn't intend to bring them all.

Mr. Zettler: Does your offer include allowing us to pick out some of these heads and bring them into court?

Mr. Dorety: Certainly.

The Court: Members of the jury: Subject to the instructions heretofore given you will be excused until to-morrow morning at 9:30 o'clock.

June 16, 1914.

Morning Session.

101 THOMAS HANSOM, recalled for further cross-examination.

Q. Mr. Hansom, do you remember of having a talk with Mr. Brady, the traveling engineer for the Great Northern, at Providence Hospital, about ten days or two weeks before you left the hospital?

A. Yes.

Q. That was how long after this explosion took place?

A. I don't know.

Q. A couple of months?

A. Yes, I believe it was all of that.

Q. You were in good mental condition at that time?

A. Yes, sir.

Q. I will ask you whether on that occasion you stated to Mr. Brady that you had asked Engineer Thoms to try the gauge cocks on this engine and that he was about to try them when the explosion took place, and whether he asked you what your reason had been for asking Engineer Thoms to try the gauge cocks, and whether you didn't say in reply that there had been only a couple of inches of water in the water glass and that it was stationary, and you were afraid the glass was not working?

A. I believe Mr. Brady misinterpreted my answers. I remember Mr. Brady asking me how much water there was in the water glass and my telling him there was two inches, and the way the question came up about the gauge cocks Engineer Thoms and myself were carrying on a conversation and from his position he could not see the water glass at that time and he asked me how much water there was in the water glass, and I told him in a kind of a joke, why did he want to know, to try his gauge cocks.

Q. Then you didn't tell Mr. Brady that the reason why you had asked him to try the gauge cocks was that the water was stationary in the glass?

102 A. No, sir.

Q. Did you make any statement that the water was stationary in the glass?

A. Well, I don't know whether I did or not to that effect.

Q. Did you say the engineer could not see the water glass from where he was?

A. I don't believe he could.

Q. Can't the engineer see the water glass at all times?

A. Not from certain positions I don't believe he can.

Q. If he is on the side of the engine where he belongs he can see it?

A. There are certain positions where he can not see it I believe.

Q. It is right on the end of the boiler?

A. Yes, sir.

Q. And his seat is right by the end of the boiler?

A. Yes.

Q. What position was he in that he could not see it?

A. He was sitting on the seat box.

Q. Can't the engineer see the water glass from the seat box?

A. You see they have a guard over the water glass and it only leaves a little opening, about $\frac{3}{4}$ of an inch, on three sides of the water glass, and unless he happens to be seated in line with this opening he cannot see it.

Q. Isn't it a fact, Mr. Hanson, that the water glass is especially constructed so as to be easily seen by the engineer and fireman sitting in their seats, and that they are constantly looking at it or ought to be?

A. They ought to be?

Q. And it is fixed so they can?

A. He can from different positions, but I believe there are certain positions where he cannot see it; they move one way or the
103 other.

Q. You mean he would have to move his head?

A. His body.

Q. How far?

A. I could not say.

Q. At any rate you think it was easier to shout out at you to look than it would for him to look himself?

A. For all I know he might have looked. As far as I know he just asked me to look—as far as I know.

Redirect:

Q. Mr. Hansom, is it the duty of the engineer to supervise the actions of the fireman?

A. It is, yes, sir.

Q. Is it his duty to ascertain whether the fireman is paying attention to his duties?

A. Yes, sir.

Q. Is it part of his duty to find out whether the fireman is observing as to the condition of the water?

A. Yes, sir.

Q. And is it the practice for the engineer to ask the fireman how much water there is in the water glass for the purpose of ascertaining whether the fireman knows?

A. Yes, sir, it is.

(Witness excused.)

C. E. McGRATH, recalled for further cross-examination.

Q. Mr. McGrath, did you succeed in finding an account of Cole's experiments of which I spoke?

A. I didn't look them up. I didn't know you cared to have them at all.

Q. You said yesterday that from the estimates which you made the temperature on the lower side of the crown sheet, the temperature of the metal would be something like 100 degrees?

A. Yes, sir.

Q. And it is on the assumption that that was correct or that at least it reached a high degree of temperature that your entire objection to the button head bolt was based?

A. Yes, sir, it was.

Q. I think you said you had no authority tending to show that the sheet did reach that temperature.

A. Yes, I have.

Q. Where is it?

A. Here it is (producing book). This experiment shows that with a flame at a temperature of 3200 degrees the temperature of the bolt on the fire side is 1060 degrees. Before I assumed it as being 900 degrees which was rather low; and this experiment was made under the identical conditions which obtained in this particular fire box, a 3/8 inch plate.

Q. What is it?

A. Stronheider.

Q. Will you examine this table in a book on the care of locomotives by Myron E. Wells, a member of the Master Boiler Makers' Association and tell the jury what that indicates as to the temperature on the heat side of a clean plate exposed to gas at about 1,500 degrees?

Mr. Zettler: Are you asking that to go into the evidence?

Mr. Dorety: I am asking it as part of the cross-examination. Yes, to go into the record.

Mr. Zettler: I object to his reading it.

The Court: Objection sustained. Exception noted.

Q. Is it not a fact that according to this authority the temperature of the lower side or the heat side of the sheet is given as 240 degrees Fahrenheit?

105 Mr. Zettler: I object on the same ground.

The Court: I will overrule the objection in view of what has gone before, the reference made to the authority in the question. It amounts to asking him if there was not some other authority. Exception noted.

A. This sheet is exposed to 1500 degrees temperature, and also these experiments, I note, are experiments for the purpose of determining the effect of layers of crust on the plate; it doesn't fit the case.

Q. Is it not a fact that the first experiment specifies a clean plate, the one I am referring to, and the latter one refers to crust?

A. It does.

Q. According to that test, with 1500 degrees in the fire box the temperature on the heat side of the sheet would be 240 degrees?

A. On a clean plate, but if there is accumulation of any kind of non-conductor it hardly gives it.

Q. But then with a non-conductor it doesn't get above 360 degrees?

A. It is according to what non-conductor; also, that is a very low temperature compared to the other.

Q. Now, according to this table, what is the difference between the temperature on the hot side of the plate and the temperature of the water?

A. About 70 degrees.

Q. It runs from 67 to 85?

A. Yes.

Q. So that, according to this authority, the metal on the lower or hot side is only about 70 degrees more than the metal on the other side?

A. The authority doesn't state the thickness of that plate; it makes all the difference in the world.

106 Q. There is a third of an inch in this other experiment. Take one-fourth inch for it?

A. A $\frac{3}{8}$ inch plate makes a difference.

Q. How much difference?

A. A good many degrees. It is right there.

Q. Would it make it ten times as great?

A. I think it would very nearly. Not necessarily ten times—two or three. If it was ten times less it would be about eight or nine hundred.

Q. With three times less it would make a difference of 200 degrees instead of 67?

A. Much more, yes.

Q. What is three times 67?

A. That doesn't fit the situation.

Q. I will ask you to examine this authority, Barr on Boilers & Furnaces, page 138 and following, and particularly Cole's experiments, and ask you if it is not a fact that that experiment by a member of the American Society of Mechanical Engineers who made tests with different types of bolts, some with the little bolt head and some with the large button head, and concluded from the above tests that the button head was the strongest?

A. (Witness examined book.)

Q. You may take that with you and look it over and answer later.

(Witness excused for the present.)

JAMES McCABE, called as a witness by plaintiff, sworn and testified:

Direct examination.

Mr. Zettler:

Q. As the attorney of record, I will ask you this: Is Mrs. Donaldson the administratrix of the estate of Vance H. Thoms, deceased, and was she such at the commencement of this action?

A. She was and she is.

107 Q. Mr. McCabe, have you ever been a railroad man?

A. I have.

Q. How long have you been such?

A. Thirteen years.

Q. In what capacity?

A. Locomotive engineer and fireman.

Q. How long have you been a locomotive engineer?

A. I run about eight years and a half or nine years.

Q. For what roads?

A. The Chicago, St. Paul & Minneapolis & Omaha, the Chicago and Great Western, Great Northern, Santa Fe and Southern Pacific.

Q. Have you had experience with oil burning locomotives?

A. I have.

Q. Are you familiar with coal-burning and oil-burning locomotives?

A. I am.

Q. Now, will you go to the sketch and explain to the jury just what the effect of an oil burning flame is on a bolt head marked 1 on Plaintiff's Exhibit A, assuming that there is 3,000 to 3,500 degrees of heat in the fire box, that is in this portion around here? (Ind.)

Q. (Ind.) This is the crown sheet and this is the outer shell. The crown bolts extend from the outer shell through the inner shell of the crown sheet, and is riveted through in this manner here. With this large head when the boiler is hot there is a variation that will amount to perhaps $\frac{3}{8}$ of an inch—this sheet may move this direction and it may move to the other direction, and this sheet the same; and assuming that the outer sheet moves simply this way and the inner sheet simply this or in the opposite direction, it will produce a lever here and open up this edge of the bolt along here of Plaintiff's Ex. 1 which will allow a cushion or film of air to be in there and the large amount of metal will
108 overheat.

Q. What effect on the button head has the overheating of it?

A. It has the effect of crystal-izing the head or softening the head, and if it will overheat it to a sufficient degree with the pressure on the top the steam outward will cause the head to pull over and the steam come down and the explosion follows.

Q. Referring now to Figure No. 3 or the small bolt, what effect has the oil burning flame on that sort of a bolt head, if you know?

A. The variation in the sheet will possibly be the same, but the head is pounded over, a hammered head, and is very thin and is closer to the water, and if there is any variation it is only slight and possibly not any at all between the head and the sheet for a film of air, or a non-conductor of heat, to get in there. That is clear around in the button heads.

Q. Did you take part in the examination of the crown sheet and the crown bolts taken from Great Northern engine No. 1902?

A. I did.

Q. Did you personally examine the crown sheet and the crown bolts?

A. I did.

Q. Did you inspect any of the crown bolt heads at that time?

A. Three that had been brought on by somebody I don't know. Mr. Dorety had them in his possession.

Q. How many crown bolt heads were there from that engine?

A. 200.

Q. Where were the others?

A. I was informed by Mr. Kelly——

Mr. Dorety: I object.

The Court: It will be sustained. Exception given.

Q. Who is Mr. Kelly?

A. General Master Mechanic of the Great Northern, Western District.

Q. Is he an official of the Great Northern?

A. He is.

109 Q. What has he charge of?

A. Mechanical department.

Q. Does that include the engine part?

A. It does.

Q. Did you make demand upon him for the crown bolt heads or just the three?

A. I did.

Mr. Dorety: Objected to as incompetent, irrelevant and immaterial and not the best evidence. There is a proper way to make demand for evidence.

(Argument.)

The Court: I will sustain the objection. Exception noted.

Q. I will ask you, Mr. McCabe, at that time what statement Mr. Dorety, the attorney for the defendant, made to you in regard to the whereabouts of the crown bolt heads that were taken from defendant's engine No. 1902, in regard to admissions?

Mr. Dorety: I will make the same objection.

The Court: I do not understand the question.

Q. What I intended to ask what admissions an officer of the defendant, the attorney for the defendant, made in regard to the whereabouts of evidence?

The Court: I don't think the whereabouts got anything to do with the case.

Mr. Zettler: At this time I offer to prove by this witness——

Mr. Dorety: I suggest that counsel offer to prove he dictated to the stenographer and the court.

The Court: I think that the jury will discriminate between an offer made by counsel and testimony on the witness stand given by witnesses. You may make any offer you desire. Exception saved.

Mr. Zettler: I offer to prove by this witness that the General Master Mechanic of the defendant railroad company and counsel for the defendant railroad company, when demanded by plaintiff's attorney the production of the crown bolt heads from engine

110 No. 1902 it was stated by them that they had no idea where they were, and that they didn't know where they were and that they would not produce them for an examination by plaintiff.

Mr. Dorety: If you will substitute "could not" for "would not" I will admit the whole thing.

Mr. Zettler: In view of Mr. Dorety's admission, the offer is amended by substituting "could not" instead of "would not".

Q. I will ask you if in your experience as an engineer, Mr. McCale, have you ever seen used a head as large as the one indicated on Figure 1 of Plaintiff's Exhibit A used on oil burning engines outside of the Great Northern Railway Company.

A. I have not.

Q. You say that you have worked on roads using oil burning engines?

A. Yes, sir.

Q. What kind of heads are used on oil burning engines as far as your experience goes?

A. A hammered head, as indicated on Plaintiff's Exhibit A. Figure No. 3.

Q. Are you familiar with the safety device known as safety fusible plugs in crown sheets?

A. I am.

Q. For what purpose are they used in oil burning engines?

A. To prevent boiler explosions.

Q. Is it or is it not practical for a railroad company to use this safety device?

A. It is.

Q. In your examination of the crown sheet taken from defendant's engine No. 1902 state whether or not you saw signs of overheat on that crown sheet such as would indicate low water?

A. I did not.

Q. Had the water been allowed to be low by the engineer of that engine could you have seen the discoloration in the crown sheet at the time you examined it?

111 A. Yes, sir.

Q. Did you see such discoloration?

A. I did not.

Q. Did any part of the crown sheet show signs of overheat?

A. It did.

Q. What part?

A. May I come down?

Q. Yes, come down.

A. (Witness goes to Exhibit A:) Starting with the sixth row from the back of crown bolts and crown heads towards the front of the crown sheet to the eleventh row, the threads in the sheet showed signs of overheat.

Q. Was this on the crown sheet?

A. The threads on the crown sheet.

Q. Any on the crown sheet itself?

A. No.

Q. What was the cause of this? What would you say the cause of this was, of this overheating? Did you observe?

A. The only possible cause of the threads being overheated back in that position would be foreign matter accumulated around on the top of the crown sheet on the inner side commonly called scale.

Q. What effect has such an accumulation of scale on crown bolt heads in oil burning engines?

A. The scale is a non-conductor of heat and that removes the heat just that much farther from the water, in placing of a non-conductor between the heat and the water, and the bolt will accordingly become overheated.

Q. Is there a practical remedy for this accumulation of scale?

A. There is.

Q. What is that remedy, if you know?

112 A. Proper boiler washing.

Q. Have you yourself, Mr. McCabe, personally operated engines of the 1900 class of the Great Northern Railroad of which 1902 is one?

A. I have.

Q. If the testimony of the fireman, Mr. Hansom, is correct, that there were four or five inches of water in the water glass and that the water glass was working properly, would you say that this was or was not the usual amount of water carried in that class of engine?

A. That is the usual amount.

Q. Is this in any way too low or dangerous?

A. No, sir.

Q. Were you personally acquainted with the deceased, Vance Thoms?

A. I was.

Q. How well were you acquainted with him?

A. He fired for me and I have known him since 1906.

Q. What do you mean by "firing" for you?

A. When I was engineer Vance Thoms was the fireman on the same engine.

Q. Do you know what his habits were?

A. I do.

Q. What were his habits as to sobriety and saving?

A. He didn't smoke, chew nor drink.

Q. What was his physical condition?

- A. Excellent, a strong and robust young man.
Q. What about his inclination or disinclination to work?
A. A hard worker.

Cross-examination.

Mr. Dorety:

- Q. If your testimony as to the value of the big bolt head is assuming a temperature in the fire box of from 3,000 to 3,500
113 degrees, what would your testimony be if you assumed a temperature of 2,000 to 2,500 degrees?
A. Is that all the question?
Q. Yes.
A. I think that 2,000 degrees with a large head is fairly safe.
Q. Would you say so at 2,500?
A. Yes. That is about the limit.
Q. It is your opinion is it that the heat from an oil burning flame develops a temperature up to 3,500?
A. Yes.
Q. Now applying an oil torch that would give about the same heat?
A. I don't know.
Q. You have seen them, haven't you?
A. I don't know to what you have reference.
Q. You have seen these blow torches which are something like the flame that the blacksmiths use only they have an opening about that large (ind.) and the fuel is a mixture of oil and oxygen, under proper arrangement, to burn metal material? Have you ever seen one of those in shops?
A. I have seen a device they use to heat tires if that is what you have reference to.
Q. Does that answer the description?
A. It is a mechanical device; I think gasoline is used on it, and it is blazing all around the outlet, and a shield is placed around that.
Q. This fuel in the locomotive consists of the oil going into the engine through a pipe about an inch in diameter, doesn't it?
A. It is larger than that, possibly an inch and a half.
Q. Approximately an inch and a half, somewhere along there, and then strikes a corrugated plate about three or four inches wide which sprays the oil.
114 A. Yes, the oil flows into the burner and down on the plate, and the steam from the atomizer is blown out through and the oil and steam mix together.
Q. So that all the fire in the fire box goes out of this pipe and off of this plate that I speak of?
A. No, there is not any fire comes off the plate.
Q. All the fuel?
A. Yes, having reference to an oil burner.
Q. It would be similar to the apparatus I describe as a blow torch?
A. I don't know, Mr. Dorety.

Q. Based on your experience, what would you say about this?

A. (No answer).

Q. Suppose you made a box out of $\frac{3}{8}$ inch boiler plate, 2 feet long, 1 foot wide and 8 inches high, and put five or six bolts up through the bottom of the crown sheet, some with the button heads and some with the small heads. Suppose you brick that in underneath so as to get a small furnace about a foot deep and a foot wide, and fire coming in from the blow torch, and open at the other side, and you put water in the box and try to burn the buttons off, would you say it could be done?

A. Would you say that was the fire box for that purpose?

Q. I would like for you to answer this question first. If you don't know you can say so.

A. I never tried it.

Q. I am trying to test your knowledge of conditions of this sort. Have you knowledge enough and experience in these things?

A. Not in reference to oil being burned in a wooden box.

Q. No, a boiler plate box with a brick furnace underneath.

A. (No answer).

Q. Assuming these conditions I described, and basing your answer on your experience and knowledge of these things,
115 can you give the jury an opinion as to what would be the effect on the button heads, making a test like that?

A. With an oil heat?

Q. Yes.

A. Yes.

Q. What is your opinion?

A. It is as I said before, with the large amount of material in this kind of button heads as used on engine No. 1902, that when the plate varies at a stress in the inner and outer sheet this may open it here or here (ind), a non-conductor is then formed, the heat in direct contact on the head of this large area, having no communication whatever or no way of reaching this water, that it will become burned, overheated, soft. If it doesn't become soft enough to blow off when it becomes cool, it will become slightly crystalized, here. That condition does not exist here on this kind of a bolt. Figure 3 on Plaintiff's Exhibit A.

Q. Assuming the variation of the sheets to be the same and the stress to be the same, like this plate over in this manner —

Mr. Zettler: May I inquire are you basing your question on like conditions, on an open box with bolts up through or a boiler in a locomotive?

A. I assumed your question was with a boiler on a locomotive.
The Court. Perhaps we better have that question read.

Q. I will repeat it. I ask you to tell this to the jury: Mr. McCabe, assuming that a box such as I described to you—you remember the description, don't you, 2 feet long, 1 foot wide and 8 inches high, open at the top, made of boiler plate, with bolts screwed up from the bottom, just as they are through the crown sheet, and no sheet on top, and a fire under that box. Assuming that were put over a

116 brick furnace about the same size, and apply an oil torch directly against the heads, the flame directly upon them, what would you say would be the effect of that on the heads of the bolts?

A. The same sized heads?

Q. The same sized heads?

A. What is the temperature of the oil flame, Mr. Dorety?

Q. What is it?

A. I don't know, I am asking you.

Q. Assuming it is the same temperature as any other flame. Assuming it would be just the same as any other—we will say 3,500 degrees—You know how hot this is, whatever it is, what would be the effect on the bolts?

A. As fast as the heat is generated in the metal there it naturally extends through the head and allowed to radiate through the water. The temperature, I do not presume, would run as high as if the boiler was subjected to 200 pounds of pressure.

Q. Do you say you could burn the bolt off?

A. In what time?

Q. In any time; as long as you want it.

A. That is very indefinite.

Q. How long? Put it at 25 years. Would it ever burn off?

A. Yes, all things are destructible.

Q. How long would you think it would take to burn it off?

A. With 3,000 degrees applied?

Q. With the heat of the flame applied?

A. There is water on the sheet all the time?

Q. Yes.

A. There would be no stress or pull, and the test only be assuming that the bolt is between the head and the water and the sheet has water on it? It might be it would last an hour and it is possible that it might last, under that heat, 5000 hours.

117 Q. How long would you say it would take to get it red hot?

A. In the dark or the light?

Q. We will say hot enough to burn a stick. Hot enough to ignite a piece of wood pressed against it.

A. Wood ignites at about 250 degrees Fahrenheit, pine wood?

Q. I don't know, you are the expert here.

A. You could specify the kind of wood, it is your theory.

Q. We will take pine wood. Would you say 5 minutes would do it?

A. From your own standard, 5 minutes to an indefinite period.

Q. Anywhere from 5 minutes to five years?

A. That is satisfactory, Mr. Dorety.

Q. Is that your answer?

A. I say within that period.

Q. Isn't there an element of uncertainty in your answers to both these questions?

A. That is a question perhaps for the jury to decide.

Q. Can you reduce them to any greater certainty?

A. No, not the questions you asked.

Q. What I want to know is, can you give them any information that is reliable, anything on the questions I have asked?

Mr. Zettler: I object to that question.

The Court: I will sustain the objection. Exception noted.

Q. Can you give them any definite information?

A. I can give them some definite information on the practical side, Mr. Dorety. The practical side is the fuel applied to the fire box as in engine 1902.

Q. You said that normally this stress crystalized the bolt head, is that right?

A. Yes.

Q. All right, we will come to actual conditions on an engine like that 1902. How long would it take under ordinary conditions to produce that crystalization?

118 A. That is very indefinite as to how long. It might be only a very few minutes or it might last for a good length of time.

Q. It might be five minutes or it might be five years or so?

A. Hardly five years.

Q. Assuming that was the engine, what is the result of it? Will you give the jury a maximum limit on that?

A. Yes, the sheets in that class of engine, the inner sheets, exposed to the direct contact of the flame will last from three to four years in oil, and the same sheet will probably last fifteen to twenty years with coal.

Q. You know it is a fact, do you not, that heads of that character have been used ten years in oil?

A. I do not.

Q. Do you know that Great Northern engine No. 1905 has been running five years with that class of bolt?

A. With the same bolts never having been changed?

Q. Yes.

A. No, I don't know that, Mr. Dorety.

Q. Do you know the contrary?

A. I have seen engine 1905 when she looked like from the leaks in the crown sheet that all of them ought to be changed.

Q. Do you know the contrary? Answer "Yes" or "No." You know whether you know it or not.

A. I don't know that the bolts have been in there five years.

Q. You said that you had never seen on a road you have worked on a button head as large as that. You have seen button heads used on oil-burning engines?

A. Except the Great Northern, no.

Q. The other roads you have seen button heads, if any, they were not as large as that where they were used on oil?

A. I hardly think you would call them a button head. I think they call them a hammered head in preference to button head.

119 Q. Regardless of what they call them, a bolt with a forged head?

A. You mean by forged head the bolt and head is made at one time?

Q. Yes.

A. Yes.

Q. And they differed from this only in the size of the head?

A. Yes.

Q. Did you ever run an oil burner on any of the roads?

A. Yes.

Q. What road?

A. The Southern Pacific.

Q. Is that the only road?

A. The Great Northern.

Q. I mean beside the Great Northern? The Southern Pacific is the only road outside of the Great Northern where you run an oil burner?

A. The Santa Fe.

Q. By the way, before I forget it, the Great Northern doesn't use the type of bolt shown as No. 1 on your exhibit, with that square nut left on, does it?

A. I have seen them left on.

Q. What is the practice?

A. To leave them on.

Q. The practice is to leave them on?

A. Yes.

By Mr. Zettler:)

Q. You are referring now to the time you run it?

A. Yes.

(By Mr. Dorety:)

Q. Do you know what the practice is now or has been for the last year?

A. I do not.

Q. Now, Mr. McCabe, did you draw the original complaint?

A. Yes.

Q. It is true, is it not, that all the evidence which you have offered on behalf of the plaintiff in this action, the absence of the fusible plug can have nothing to do with the cause of the explosion?

A. It could have prevented the explosion.

Q. With 4 inches of water on the sheet?

A. Not at that specific time, but if the sheet had been overheated a number of times the fusible plug would have melted out on the boiler and the Great Northern officials would have noticed that that crown sheet and these crown bolts should have been inspected.

Q. Then tell the jury this: If on November 5, 1913, the engine being run by Engineer Thoms 10-2 had had a fusible plug in the crown sheet or half a dozen of them, could they possibly have prevented the explosion at that time if there was four inches of water on the crown sheet?

A. No.

Q. When you drew your original complaint the only charge you made against the company at that time was that it was using these heads on the bolts, is that a fact?

A. Yes, I think you and I went over that.

Q. And said nothing about the fusible plug or scale?

A. That is true.

Q. By the way, you knew they were not using fusible plugs at that time when you drew your original complaint?

A. No, I think I did not, Mr. Dorety.

Q. You run an engine a long time for the Great Northern?

A. I fired an engine I think in '98, '99 and 1900. My recollection is—I am pretty positive—that all the engines I fired for the Great Northern at that time had fusible plugs on them.

Q. You know when you were running an engine in 1910 and 1911 they didn't have?

A. My recollection is that in 1906 and 1907, the engines on the Cascade Division, at least some of them working over the
121 mountain, had fusible plugs.

Q. When did you leave the service of the company?

A. Which time?

Q. The last time?

A. The 2nd of February, 1912.

Q. They were not using fusible plugs then?

A. Not in the class of engine I was running on that particular date.

Q. Do you know of any engine they were using them on at that time?

A. No. I don't think I know enough about any other engine except the engine I operated that date.

Q. Now, this change of heart, or face, if I may call it such, or at least the change of complaint, occurred about a month ago or six months ago?

A. The record will show that.

Q. At any rate it occurred immediately after you had had a boiler maker examine the sheet to advise you whether there was any evidence of low water?

A. No.

Q. Within a week after?

A. Well, not on anything that the boiler maker on our side said.

Q. I am asking you about the coincidence in time. There was that coincidence?

A. I don't recall when the amended complaint was served. I think our inspection was made April 24.

Q. Don't you recall it was served soon after that?

A. It might possibly have been served before that.

Q. Now, in case of an explosion where the plug question is material, I mean in case of an explosion you mean to say could have been prevented by the engine itself having a plug in, you necessarily

122 have a case of low water, have you not. In other words, the presence or absence of a plug at the time of the explosion can only be material where there was low water.

A. Yes, further than what I said before in reference to the plug.

Q. Then when you say in this complaint or any complaint that the explosion is caused by lack of a plug at that time, are you not admitting negligence on the part of the engineer?

Mr. Zettler: I object to that question on the ground it is incompetent, irrelevant and immaterial.

The Court: I think those grounds are sufficient. Exception.

Q. How old a man are you, Mr. McCabe?

A. Thirty-four.

Q. How long have you been practicing law?

A. I was admitted in 1910, and I worked two years on the railroad after that—two years and a month.

Q. And you have been giving your time exclusively to law for two years and a half?

A. Yes.

Q. You left the Great Northern under circumstances somewhat distressing to both the company and yourself?

A. Not to myself, Mr. Dorety, and I don't think to the company.

Q. Is it not a fact that your leaving the company involved charges of incompetency and carelessness against you as an engineer?

A. I would be glad, Mr. Dorety, to explain the circumstances to the jury under which I left the services of the Great Northern Railway Company.

Q. I think if your attorney cares to have that go in he will perhaps ask you himself. I would like to have my question answered now. Did not your leaving the company result from charges of carelessness?

A. Those charges, if they were ever made, were never made known to me. I was relieved by the company because I went past a signal at stop, and the rules say that you must stop at a designated
123 signal and that I failed to do so.

Q. Because you ran by a signal directing you to stop you ran into another train?

A. Yes.

Q. They were both passenger trains?

A. Yes, sir.

(By Mr. Zettler:)

Q. State whether or not you have been reinstated by the Great Northern Railway Company?

A. I could have been.

Q. State whether or not you know whether your record has been cleared?

A. It has.

Q. By the Great Northern Railway Company?

A. Yes.

Q. And yourself absolved of all blame?

A. Yes.

(By Mr. Dorety:)

Q. They found you did not run by the signal at stop or that you did not run into another passenger train?

Mr. Zettler: I object to that.

The Court: I think you are——

Q. Has your knowledge and competence and ability as an engineer or boiler expert improved during the two and a half years during the time you have been practicing law or has that rather been in the background of your mind?

A. I think my mind is as keen on boilers and machinery as it was the last day I worked for the Great Northern.

Q. It is a fact that since this occurred you have rather specialized in personal injury cases against the Great Northern?

Mr. Zettler: I object to that form of question.

The Court: I think that objection should be sustained. If you wish to show he has any bias or prejudice against the Great Northern you may do it. Exception.

124 Q. Do you make it a practice, Mr. McCabe, to act as your own witness in all your own cases, or is this unusual?

A. This is the first time I have had occasion to do it, Mr. Dorety.

Q. At the present time, judging by your success as a lawyer and a boiler maker, would you consider yourself to rank higher as a boiler maker or a lawyer?

Mr. Zettler: I object to that question as highly improper.

The Court: That is sustained. Exception.

Q. Did you notice in your examination of this sheet that it was reduced in thickness, by that I mean the crown sheet of the engine?

A. I believe it was thinned down at one point.

Q. About $\frac{1}{8}$ of an inch, there was a reduction of about an $\frac{1}{8}$ of an inch?

A. Possibly.

Q. Or, in other words, about one-third of its former thickness?

A. The former thickness was $\frac{3}{8}$?

Q. Yes.

A. $\frac{1}{8}$ would be one-third of that.

Q. That is a reduction in area of the cross-section of material of about $33\frac{1}{3}$ per cent?

A. Yes.

Q. It would be impossible for that portion to be thinned down in the cross-section indicated on the sheet, or at least the upper portion of it, to have approximated the temperature of the water, or approximately 380 degrees? Am I right?

A. The upper portion of the sheet, if it is free from scale, is probably the same as the water, and the water at 200 pounds pressure contains 381 degrees of heat.

Q. Now in your long and varied railroad career, did you ever happen to learn or did you learn anywhere what the specifications

125 for this character of material permit? By that I mean what percentage in area in the reduction of the cross-section? Do you know what the percentage of reduction is?

A. I don't understand your question.

Q. You know when boilers are being built they have certain specifications that are carried out?

A. Yes.

Q. Certain tensile strength?

A. Yes.

Q. Certain percentage of reduction of the cross-section under pull without rupture?

A. Yes.

Q. Do you know what the percentage is?

A. My recollection is, from a conversation on that question with Mr. Emerson, who is now general manager of the railroad company, he informed me that the stress was 60,000 pounds tensile strength.

Q. That is the tensile strength not the reduction in area. I am asking about the edges. A reduction in area of the cross-section.

A. What do you mean by reducing the area of the cross-section?

Q. If you have a piece of steel 2 inches wide and a half inch thick, the cross-section of it would be one inch, wouldn't it?

A. 2 inches wide and a half inch all through. Yes.

Q. If you pull that cross-section would be reduced?

A. Thinned down.

Q. It would be less wide and less thick?

A. Yes.

Q. What is the minimum percentage of that reduction which is permitted by the standard specifications for this class of material cold, if you know?

A. I don't know.

126 Q. Do you know what the tensile strength of the material would be after that reduction?

A. No.

Q. Do you know at what percentage of reduction the steel bolts begin to lose their tensile strength?

A. In what manner do you use the word "tensile"? I don't know.

Q. By the way, the United States Government has a formula or requirements as to boiler construction which must be complied with before a boiler can go into service, has it not?

A. I understand so as applied to locomotives.

Q. Don't you know they have?

A. No, I do not.

Q. You know they have inspectors inspecting locomotives all over?

A. Yes.

Q. You know the two things they do not require in that list of requirements are hammered heads and fusible plugs?

A. I understand that the government has recommended that the Great Northern change their button heads as shown in Plaintiff's Figure 1 to the head marked 3.

Mr. Dorety: Read the question.

(By Stenographer:)

Q. You know the two things they do not require in that list of requirements are hammered heads and fusible plugs?

A. I answered it.

Q. Are those requirements in the list or not? I do not gather that from your answer?

A. I have stated that I have never seen the list.

Q. Then you don't know?

A. No.

Q. You know when they are not up to these requirements they will not let the engine run?

A. If they know it.

Q. If they know it?

127 A. Yes.

Q. And they have inspectors on the road finding out all the time?

A. Yes.

Q. And they certainly know what kind of bolts we use and whether we have fusible plugs or not?

A. Yes.

Q. And if they were not up to their printed regulations they would take the engine out of service at any station on the road?

A. They took engines of yours out of service.

Q. We still have engines running with large button heads and without fusible plugs?

A. I don't know.

Q. The engineers and firemen have a strong brotherhood call the Brotherhood of Firemen and Brotherhood of Locomotive Engineers?

Mr. Zettler: I object, I do not see its relevancy.

The Court: It is purely preliminary; he may answer it. Exception.

A. They have a brotherhood.

Q. And it is quite a strong organization?

A. What do you mean by "strong?"

Q. Influential with the company.

Mr. Zettler: I do not see the materiality of it and I object to it.

The Court: I do not see the materiality of the question. Exception.

Q. They have a committee to look out for matters of safety and request or demand various provisions for safety on the part of the company, have they not?

Mr. Zettler: I object to that as immaterial.

The Court: I think it is. Exception allowed.

Mr. Dorety: I would like to make an offer.

The Court: You may do so.

128 Mr. Dorety: I would like to prove by this witness on the stand that they have a committee organized for the purpose of making demands, whose duty it is to make demands of

the company and requests for provisions in regard to safety on their engines, among other things, and that there are the best and most experienced engineers on the railroad that belong to that organization; that Mr. McCabe himself is a member of it; and that they have never asked or suggested that the button head bolts be removed from our engines and other bolts substituted; or that fusible plugs have been demanded.

Mr. Zettler: I have no objection to your proving that if you can prove it by this witness.

Q. I will ask you generally if that is not the fact?

A. It is not.

Q. What part is not?

A. Not any of it, more than I am a member of the Brotherhood of Locomotive Engineers.

Q. It is a fact that the most experienced engineers on the road belong?

A. To what?

Q. To one or the other of these organizations.

A. That is a fact, but not a committee that demand of the railroad company what safety appliances shall be installed. Mr. Dowling has been the first man appointed by the Great Northern, and I think his title is "Safety First."

Q. It is true that they have this grievance committee whose duty it is to look out for these matters?

A. That is not true.

Q. They have no such grievance committee? No such committee?

A. They have no such committee as you state.

Q. They have a committee whose duty it is to take up matters of that sort with the company?

A. Yes, sir, a committee.

129 Q. It might not be a grievance committee. You may know more about it than I do.

A. I do and I don't know any such thing as that?

Q. You say then they have no committee whose duty it is to take up such matters with the company?

A. What matters do you mean?

Q. Matters of safety?

A. Yes, I mean to say that.

Q. Is it not a fact that it is customary in the Brotherhood for them to take up matters when they think their safety required it?

A. I think each and every individual on well managed railroads calls the attention of the officials to any danger that they might discern and possibly recommend. On most roads they ask their employees to recommend safety, but that is not true and never has been true on the Great Northern.

Q. Mr. McCabe, my question is, is it customary, or has it been customary, has it been done—that either one of these brotherhoods have taken up matters of safety with the company? Can you answer that?

A. If you mean by matters of safety, by the word "committee," never. Many individuals do, but they do that as individuals.

Q. And matters of equipment also?

A. In what specific instance?

Q. I am asking you if there was any specific instance?

A. Not that I know of.

Q. Is it not a fact that if the engineers and firemen considered that bolt dangerous they would send a committee to the company and ask to have it removed?

Mr. Zettler: I object to that.

The Court: That will be sustained. Exception.

Q. They never have demanded any such action.

130 Mr. Zettler: I object to that.

The Court: Same ruling. Exception noted.

Redirect:

Q. Mr. Dorety in his cross-examination referred to the recent practice of the Great Northern of removing part of the bolt head. Now, just what part did you mean by your answer?

A. This portion below the line, below the red line.

Q. Mark it with the Figure 4.

A. (Diagram marked by witness.)

A. No.

Q. Would the removal of that part below the Figure 4 have any change as to the danger of using such a large head?

A. No.

(Witness excused.)

C. E. McGRATH, recalled for further cross-examination.

Q. Mr. McGrath, I find in this book by Mr. Stromheider this statement: "It is also well known that fusible plugs in boilers are not as reliable as they should be." Is he an authority on that?

A. He may be.

Q. You don't know about that?

A. I don't know about that.

Q. I find that when he said the temperature of the sheet is over a thousand degrees, you will notice that the table gives that with mineral oil in the water, with mineral oil in the flue sheet?

A. Yes, in the water. It is not on top of this sheet.

Q. By the way the thickness of that sheet is not given?

A. It is given in the table at $\frac{3}{8}$ of an inch, the same as this.

131 Q. It is also a fact that with a $\frac{3}{8}$ inch thick sheet, and fresh water, in temperature up to 2,000 degrees, the author gives the temperature on the fire side of the sheet at 430 degrees and on the water side 344 degrees, or a difference of 84 degrees?

A. I don't see that.

Q. (Book handed to witness.)

A. It was forged fires. That experiment was performed with a forged fire, which is an open fire. This is an even fire where the heat is all confined and accumulates. Not the same conditions at all.

Q. Does it make any difference if you actually have the temperature of 2,000 degrees? Does it make any difference how you get it?

A. It certainly does; that heat is conducted away there some. Even under those conditions it is some over 2,000.

J. Do you conclude from this class of experiments that I was correct in stating that his recommendation was that the button head was the strongest and best?

A. Did I state his experiments had proven it?

Q. You are the expert.

A. You have given this to me.

Q. I am asking you whether that experiment demonstrates that.

A. I think these experiments are very good but it demonstrates the very facts that we are contending for.

Q. Does the author state this: "Both tests seem to indicate that the best rivet head which can be formed cold, made in the usual conical shape, will hold, hot or cold, much less than the solid head?"

Mr. Zetter: I object to that, the best evidence of what the author states is the author. He can ask him whether he agrees with him.

132 The Court: I think that is correct. The objection is well taken. You may ask the witness if he agrees with that conclusion. Exception noted.

A. I would like to speak further on that authority.

Mr. Dorety: I object. The question has been asked, objection made and the objection sustained. If counsel has any questions he may ask them.

Redirect examination:

Q. Just explain what you were going to explain about this authority.

Mr. Dorety: I object as not proper cross-examination. I asked one question about that book, and it was objected to and the objection sustained. The question has not been answered.

The Court: I know, he asked you whether you deemed these experiments to be proper experiments when you asked him about the conclusion. Now, if he wishes to show anything relative to these experiments I think he should be permitted to do it. Exception given.

Mr. Dorety: Your Honor has not permitted me to ask the only question I wanted to about the book.

The Court: I don't think you have a right to read out of a book.

Mr. Dorety: I called this witness and asked him just one question

about that book, which was objected to and the objection sustained, and now what can they cross-examine him on?

The Court: You can ask the question any way. Exception noted.

Q. Mr. McGrath, were you asked before in regard to those experiments in your examination?

A. I was.

Q. Did you make answer regarding that during your previous examination?

A. No. I didn't make answer.

Q. Did you state whether you were familiar with it?

133 A. I said I was not familiar with them. I was allowed to take time to read them.

Mr. Zettler: I think it would be proper, if the court please, to ask his conclusions in regard to that experiment since it has been brought before the court.

The Court: It may be done.

Q. Go ahead and explain fully all these experiments.

A. Why it says that the result of the whole series of tests, of which only a few are given, seem to indicate that the other hold better on the usual form of stay bolt at dull red or almost black heat." It doesn't matter the rest of that. It says that the experiments were made by a dull red or almost black heat. Now, it has been shown that the heads on these crown bolts could obtain a much higher heat, so for that reason these experiments would not apply to this case. Further than that, there is reason why in the results that this bolt should be countersunk in the plate in a manner like that. Also, there is recognized that *that* this head in identically the same bolts should be $1\frac{5}{8}$ inches in distance across there (ind.) whereas this is 2 inches. That means that that recommends a reduction on this area considerable. Also, they recommend the material be put in a position like that, "counter-sunk" as they call it, and they counter-sink the hold back well in the identical condition that obtains there with that kind of a bolt, and the change of condition of it would be affected by the change of form, so it practically recommends this kind of a bolt.

Q. That is as to Figure 3?

A. Yes.

Q. As I understand you, the recommendation of the investigation referred to by counsel is substantially a recommendation of Figure No. 3, of the crown bolt on Figure No. 3?

134 A. It is a recommendation of the reduction of this area in Figure 1, which is the same thing.

Recross examination:

Q. Won't you hold this book up and show the jury the book or the bolt the author recommends?

A. Here it is (ind.) the figure is given. It is counter-sunk and

reduced in this area. This is $1\frac{5}{8}$, which is $\frac{3}{8}$ less than what that bolt is.

Mr. Dorety: All the pictures on this page recommend the types of bolt that the author recommends. (Exhibiting pictures.)

Q. And it is also a fact that the bolt shown on No. 3 is a riveted bolt?

A. A riveted bolt.

Q. And that the author says there is a conclusion that riveted bolts will not hold as well as the type of bolt like our bolt which is not riveted?

A. For black heat or red heat.

Q. The bolt which he says is the stronger bolt is the one without the rivet?

A. For a black heat, on an entirely different condition than obtains here.

Q. It is true in any condition that the author recommends a riveted head in any heat?

A. In that particular article; he doesn't mean in any other.

Q. So when you tell the jury the result of his tests was a recommendation of that head, you did not mean to say that he recommends a non-riveted head?

A. He recommends a reduction of that area in there.

(Witness excused.)

Plaintiff rests.

135 Mr. Dorety: The defendant challenges the sufficiency of the evidence to sustain a verdict in favor of the plaintiff, and moves for a directed verdict and judgment in favor of the defendant.

The Court: Motion denied. Exception noted.

Mr. Dorety: If it please your Honor and ladies and gentlemen of the jury: The law and practice of the court at this time permit me to give you a summary of the issues or disputes of fact between the plaintiff and the defendant in order that you may understand our evidence more fully. In order to make it clear to you just where we differ I want to give you a brief summary of those facts stated by the plaintiff which we admit and all those facts stated in their evidence which we deny, and then tell you briefly what our evidence will be in denial of those facts so that you may understand the offer of it and the purpose of it as it moves along. Our showing will be rather long.—I feel like apologizing to the court and jury on account of the length of it. I can only give this as an apology: That the case, as you see involves an attack upon the whole Great Northern standard construction—not one particular engine. If the plaintiff is entitled to recover in this case, it is because all our engines are not properly constructed, and under that theory, whether the plaintiff's showing is strong or weak, we feel we should make and are justified in making, as strong a showing as possible in this case.

The plaintiff claims this in the first place, that the boiler exploded and that the engineer died as a result. These things we ad-

mit. They claim there were four inches of water on the crown sheet at all times. That is supported by Mr. Hansom's testimony, the fireman. He has already admitted that he told Engineer Brady that there were only two inches and we will show by Engineer 136 Brady and by the nurse in whose presence his written statement was made and by the claim agent—if we can get him here in time—that Mr. Hansom not only said that there was not four inches but that the water was down to two inches and that the water was stationary and he concluded that something was wrong with the glass and thought it might be getting too low and asked the engineer to test it but the engineer was too late. We will show that he made one such statement the day after the accident when he was entirely conscious and the other one a couple of months after when there can be no question about it. In addition to this, we will show by positive testimony, the nature of which we will outline later, that the water was low and must have been low on the crown sheet, and, as already admitted, the responsibility is with the engineer.

After showing by Mr. Hansom's testimony that there was four inches of water on the crown sheet, Mr. McGrath was called and testified that button heads were all right first but that they finally got to working because of this heat on the lower side of the crown sheet and that gas forms under them and they became insulated and finally got hot for that reason. We deny that, and we will prove by experienced men that it is not so. Mr. Pierron himself denied that that was a fact that there was any insulation there, or anything of that sort; but the trouble was with the heads, without any insulation, because of the amount of metal. That also we deny.

Mr. McGrath said that the button heads were not as good as the other on any kind of an engine, not even on coal; that we deny. Mr. Pierron said they were the best head known on coal engines; that we admit. Our evidence will be that *that* the heads are the strongest and best known on any type of locomotive. We have had 137 them tested new and tested after years of experience, and find them, after years of use, that with an eight to ten thousand pound stroke, that they will hold and with much more life than the other type. That is by actual test and not any guess.

We will then show you the fatal sheet in proof of the fact that the water was low when the accident happened. I expect to have the crown sheet here. It is a big and heavy thing, but I think it is important enough to justify our bringing it here. And you will notice in places the metal has bagged or sagged between the bolts; it will be a sort of bagged effect. We expect to show you that that cannot happen with the pressure on the crown sheet of the temperature of steam. We expect to show that the ordinary crown sheet will always hold on the pressure there is on it as long as it is exposed at the temperature of steam, and that the only way it can possibly bag or sag is when it is red hot, and it cannot be red hot with water on it.

Now, Mr. Pierron stated to you that he has seen normal sheets

sagged and if you go on any engine you will find that. In reply to that I am going to ask the court to send this jury either down to one of our depots here or to Delta shop and examine any locomotive that may be available and see for themselves whether crown sheets are bulged between bolts in ordinary use. I think that is the best demonstration of that fact.

We will show that Federal inspectors test these boilers hydrostatically, that is with a forced flame, making it just as hot to get steam as much above two hundred pounds pressure as they can, and that it has no effect either upon the bolt or the button head from the hottest possible fire they can get in it.

We expect to show that two or three months before this was tested by hydrostatic test, water pumped into the boiler and 25 per cent. more pressure put on the sheet and the bolts stood the test without any bad effects.

We expect to show that bolts of that type have been in use ten years on the Santa Fee and Southern Pacific and five years on our own railroad, and that none of them have ever dropped off while there was water above the crown sheet, and that the experience of the workers on the oil-burning railroads on this coast, where oil is cheap and easy to get at, the men who are most familiar with those things, know of no case where any crown sheet ever came down as a result of the use of this type of bolt. They won't be school boys or *lager*-engineers but men having thirty years' experience in that kind of work.

We will show that whenever an accident of this kind happens it is reported to the United States Government and an inspection is made and reports printed and published, and the data is available so that the plaintiff can have access to it and produce it if they so desire, as correct.

We will show that with either of these types of bolts the thread alone will hold the sheet. You can cut off the rivet head of No. 3 or the button head of No. 1 flush with the sheet and the threads alone will hold the sheet; that the upper part will break before the bolt will pull through.

We will show you by actual test that if the heads are taken off the threads alone are sufficient to hold the bolt, the bolt itself will break up above, before either the threads or the head; and we will show you that not by any guess of inexperienced men but by tests made upon them, some new bolts and some that have been in service.

As to what caused this explosion, we will show you, as I have stated, that the sheet was dry. It is most noticeable around the edges. You will notice in the middle of the bulge on the large bulge on the sheet, where the thickness is reduced from three-eighths to about a quarter of an inch, the thread is practically pulled clear out; and wherever the thickness is not reduced it is in the usual condition and the sheet remains the same.

We will show by the edges of the holes where the bolts came through that the threads pulled off on the bottom, and on the top portion they are not affected, which would be impossible if the sheet had not been red hot, which would be impossible if the sheet had

water on it, at the time it went down. And on the other hand, we expect to show you that if the sheet had had water on it when it went down there would be conditions which do not exist here. That it would go straight down with all the threads stripped off the holes.

We expect to show you that where the fire was the hottest the scale which adheres more or less to every boiler sheet and which is still on it in some places, this was burnt off, and could only result from being red too. We expect to show that the sheet after the accident, as well as the bolts and the heads of bolts which held it up, was blue, which could only result from there not being any water on it.

In proving these facts we expect to show you and bring before you to testify the men who have had the widest—who will testify to these things—are the men who have had the greatest experience of any Americans on oil-burning locomotives, the pioneers from the pioneer oil-burning roads, like the Southern Pacific and Santa Fe, the Oregon Short Line, and roads of that character. There is Mr. Russell, the chief designer of the Southern Pacific; Mr. Hinckley, master mechanic of the Oregon Short Line and superintendent of motive power of the Oregon Shore Line; Mr. Johnston, the chief boiler expert of the Santa Fe road, a man who is also presi-

140 dent of the Master Boiler Makers Association of the United States; Mr. Dixon, superintendent of motive power of the Spokane, Portland & Seattle; Mr. Davis of the Northern Pacific. In addition to these railroad men, Mr. Murray boiler inspector of the city of Seattle, and Mr. Daugherty, who is employed by the government at Bremerton, and whose name should be a recommendation in itself.

As to scale being responsible for this accident, we expect to show you that scale does not form to an appreciable extent in the water in use in this district. If any of you have lived in California or east of the mountains where there is a good deal of lime in the water you probably notice the difference in the deposits in your tea kettles in such places and that sort of thing out here.

We expect to show you that the boiler was inspected by the United States government every thirty days; that it has been washed out and inspected every thirty days. That is a requirement that is made not only in cases where it is necessary here, but it is the maximum requirement made by the government even in bad water districts. They have that rule all over the country and we comply with it and make these washings and inspections every thirty days. And, while that scale does not adhere to plates in this district, except such a trace of scale as you will find on the sheet here, this sheet was scraped two or three months before the explosion; the flue sheet in front of the fire box had been taken out entirely so that all this part (ind.) of the fire box was open and the sheet was scraped and cleaned then and had been washed out every thirty days since then. It was inspected twice the day before this accident, and the crown sheet was without this sag and no bad conditions indicated.

As to the contention of the fusible plugs, they have testified
141 that they could have nothing to do with it if there were four inches of water on the sheet, and we do not dispute it; we admit it.

However, we expect to show that there was no water on the sheet, and if so, even then under those conditions fusible plugs are not to be relied upon. They have been tried on this road and discarded, tried on a number of other roads and they discarded them, and, so far as our witnesses know, the only road now using them is the Southern Pacific, and they are dissatisfied and are experimenting to find a suitable one there. We expect to show you that explosions occur down there. We expect to show you that two or more explosions occurred recently far more disastrous than this one due to low water, and that a fusible plug has been known to let go when there is plenty of water in the boiler and injure the engineer. The theory of that seems that the metal will corrode when they are put to service and a scale seems to form, so that they do not melt.

The government does not require them and does not permit them unless they are washed and cleaned every thirty days. We will show that even where that protection has been demanded explosions occur in spite of them.

The showing, as I say, seems like making a mountain out of a mole hill, so far as this particular case is concerned, but, as I say, it is our standard construction we are seeking to defend before you and is my apology for the length we have to go.

142 JOHN BRADY, called as a witness by the defendant, being first duly sworn, testified as follows:

Direct examination.

Mr. Dorety:

Q. Where do you live?

A. Seattle.

Q. What is your business?

A. Locomotive engineer.

Q. Do you know Mr. Hansom, the fireman, who testified for the plaintiff in this case?

A. Yes, sir.

Q. Did you see him at the Providence Hospital, in Everett, a couple of months after this accident, a couple of weeks before he got out of the hospital?

A. Yes.

Q. Did you have any talk with him about the accident?

A. Yes, sir.

Q. I will ask you, Mr. Brady, whether it is a fact that at that time and place he said to you, whether it is a fact that he said to you that he had asked the engineer to try the gauge cocks just before the accident, and that you then asked him why he had asked that of the engineer and he told you that it was because he noticed the water was standing still and there was about two inches in the glass?

A. Yes, he did.

Cross-examination.

Mr. McCabe:

Q. Why did you go to the hospital to see Mr. Hansom, Mr. Brady, to get a statement from him?

A. I went there under instructions from Mr. Kelly.

Q. How many times did you go up there to see Mr. Hansom?

143 A. Once, under instructions from Mr. Kelly.

Q. How long was that after the first time, after he was in the hospital?

A. I cannot say, there was a month before.

Q. A month after he went in that you made your first visit?

A. Two months or six weeks after I made my first visit until I made my second.

Q. How long after Mr. Hansom was in the hospital until you went first there?

A. Probably two weeks.

Q. You are an official of the Great Northern, are you not, Mr. Brady?

A. Yes, sir.

Q. In the position that engine was at the time of the explosion— You know the exact spot, do you not?

A. No, I do not.

Q. Do you know within a half mile of where it was?

A. All I know is what I was told about where it was.

Q. With 2 or 3 inches of water in the water glass on the grade where the explosion occurred, and you saw the engine, would you consider that perfectly safe?

Mr. Dorety: I object to the question as not proper cross-examination.

The Court: Sustained. Exception.

Q. You are still in the employ of the company?

A. Yes, sir.

(Witness excused.)

Miss JACOBS, called as a witness by the defendant, sworn, and testified:

Direct examination:

Q. Where do you reside?

144 A. At the Providence Hospital.

Q. The Providence Hospital here in Everett?

A. Yes.

Q. You are a nurse in the hospital?

A. Yes, sir.

Q. Did you know Mr. Hansom, the gentleman sitting there on the end (ind.) when he was in the hospital?

A. Yes, sir.

Q. Do you remember of any written statement or account of the accident having been written and read over to him and his stating whether or not it was correct while you were there?

A. Yes, sir.

Q. Did you sign that statement as a witness?

A. I did.

Q. Mr. Hansom himself was not able to sign?

A. I don't remember that.

Q. I will ask you if this is the statement which you signed?

A. This is what I signed.

Q. This is referring to the paper marked as Defendant's Exhibit 1 for identification?

A. Yes.

Q. Was this paper read over to Mr. Hansom?

A. It was.

Q. Did he state whether or not it was correct?

A. He said "Yes" in my presence.

Q. Was he conscious at the time?

A. Well, I was sure he was conscious.

Mr. Dorety: I offer Defendant's Exhibit 1 in evidence.

Mr. Zettler: No objection.

The Court: It may be received.

Cross-examination.

Mr. McCabe:

Q. How long after the accident was this purported statement made?

145 A. I don't remember.

Q. You don't remember whether it was one day or one month?

A. It was not one month.

Q. You are still an employee of the Providence Hospital?

A. I am.

Q. You went over all your testimony with Mr. Dorety?

A. I talked to him.

Q. Mr. Dorety has inquired of you and went over all the testimony you have given here?

A. He has not.

Q. He did go over it with you?

A. When?

Q. Any time.

A. Nobody only the claim agent read it to me.

Q. The claim agent?

A. Yes, sir.

Redirect examination:

Q. What was it that the claim agent went over with you?

A. That statement of Mr. Hansom's.

Q. He has not talked with you about testifying in this case, has he?

A. No, sir, he has not.

(Witness excused.)

Mr. Dorety: I would like to read a portion of this exhibit, if I may, which has been admitted in evidence: "I was standing up near fire box at the time looking at the water glass, and Engineer Thoms had just rose to try gauge cocks. We were running about six miles an hour at the time."

Mr. Zettler: Are you reading the whole statement?

Mr. Dorety: No.

Mr. Zettler: We would prefer that the whole statement be read.

Mr. Dorety:

"EVERETT, WASH., November 6, 1913.

"My name is Thomas Hanson and I am employed by
146 the Great Northern Railway Company as fireman. I was
fireman on Ex. East No. — Conductor Burton, from Gold Bar
to Leavenworth, on November 5, 1913. We had two helper en-
gines No. 1902, Engineer V. H. Thoms, myself as fireman, and
Engine 1929, Engineer Thomas. Our engine No. 1902 was in the
middle of the train. I could not say how many cars we had but
we left Gold Bar at about 4:15 A. M., but were called for 1:50
A. M. We took water when we left Gold Bar which was at about
1:20 A. M., and we arrived at Skykomish at 6:30 A. M. We also
took water at Reiter at about 4:45 A. M., and when he got to Sky-
komish we had about a foot of water in the tank. The boiler was
full of water. We were at Skykomish about 45 minutes, and about
20 minutes before leaving Skykomish we took water and we then
had about a foot of water in tank. The boiler was full and we
had about 200 pounds of steam on at the time. Everything was
working all right on engine, but there were some stay bolts on
boiler leaking on both sides of fire box. Engineer Thoms and
myself had made the trip with engine 1902 from Leavenworth on
November 4, and the stay bolts were leaking then. I told Engineer
Thoms, and I think he reported it, although I am not sure. This
would naturally cause a loss of water in boiler but not enough to
amount to anything. When we left Skykomish at about 7:40
A. M. I looked to see if we had enough water. This was after we
had taken water at Skykomish and when we started from Skyko-
mish we had a full tank of water and the water glass in *col* of
engine showed about $\frac{3}{4}$ full. Engineer Thoms had asked me if
the tank was full before leaving Skykomish, so I went back to
look. We had gone about six miles from Skykomish and during
that time I kept watch of amount of water in boiler, and while I
was looking at water glass to see how much water we had the glass
showed about two inches and at this time the explosion took
147 place. I had asked engineer to try the gauge cocks as the
water in glass appeared to be standing still, and I think

Engineer Thoms was doing so when accident took place. The water in glass standing still would indicate that glass was stopped up and as glass showed two inches of water I could not say whether we had any less or not, as engineer did not have time to try gauge cocks.

"I was standing up near fire box at time looking at water glass and Engineer Thoms had just rose to try gauge cocks. We were running about 6 miles an hour at the time. I have been firing on this engine about 4 months, and about 2 months ago the side sheet cracked and same was patched at Gold Bar or Everett. The side sheet was cracked at right hand side of box. The trip from Leavenworth on November 4 was the first time I had been on this engine for a month. I do not know what caused accident.

"Statement was read to Fireman Thomas Hansom and he said same was correct. He could not sign same on account of injured hand."

Witnesses:

"MISS LENA JACOBS."

WILLIAM S. CHEMIDLIN, a witness, called on behalf of the defendant, sworn, and testified as follows:

Direct examination.

Mr. Dorety:

Q. You are traveling claim agent for the Great Northern?

A. Yes.

Q. Do you live in Seattle?

A. Yes.

Q. Do you know Mr. Hanson, the gentleman sitting on 148 the end of the seat here?

A. Yes, sir.

Q. Did you see him on the day after the accident to engine No. 1902?

A. Either the day or the day after that.

Q. Did you have any talk with him at that time about the accident?

A. No, only relative to the statement.

Q. Did he give you an account of the accident?

A. Yes, sir.

Q. Did you hear the statement that I just read?

A. Yes, sir.

Q. Is that the account that he gave you?

A. Yes, sir.

Q. Were all the facts in that statement given to you by him?

A. Yes, sir.

Q. Calling your attention to the paper marked Exhibit 1 of the defendant, I will ask you who wrote that?

A. I did.

Q. When?

Q. The day I got the statement from him.

Q. Was it in his presence?

A. Yes, sir.

Q. Does it contain just what he told you?

A. Yes, sir.

Q. Was it, or was it not read over to him after it was written?

A. It was.

Q. Did he make any statement as to its being correct or incorrect?

A. He said it was correct.

Q. Was he in a frame of mind to know what he was talking about?

A. He was.

Q. Did he seem familiar with such details as the time the train left various points and the time they took water, etc.?

149 A. Yes, sir.

Cross-examination.

Mr. McCabe:

Q. The principal part of your duties as claim agent is to get such statements right after all accidents?

A. It is a part of my duties to get statements relative to the facts.

Q. As soon thereafter as possible?

A. If it is possible.

Q. You are still in the employ of the Great Northern, the claim department?

A. Yes, sir.

(Witness excused.)

The Court: Members of the jury, subject to the instructions heretofore given you, you will be excused until 1:30 o'clock this afternoon.

Afternoon Session.

ROBERT E. HAWKINS, called as a witness by the defendant, being first duly sworn, testified as follows:

Direct examination.

Mr. Dorety:

Q. Where do you reside, Mr. Hawkins?

150 A. St. Paul, Minnesota.

Q. What is your business?

A. Superintendent of motive power of the Great Northern Railway.

Q. What are your duties as superintendena of motive power of the Great Northern?

A. To have general supervision of the mechanical department of the Great Northern road.

Q. Does that include engines, locomotives?

A. Yes, sir.

Q. You are the highest official in that particular department?

A. Yes, sir.

Q. What has been your technical training in road operation?

A. I have been with the Great Northern for fifteen years as chief draftsman, mechanical designer and mechanical engineer, master mechanic, assistant superintendent of motive power and superintendent of motive power.

Q. What experience have you had with what is known as the button head type of crown bolt on oil-burning locomotives and all locomotives?

A. It has been our practice to use the button head type of crown bolts on coal and oil burning engines.

Mr. Zettler: I move to strike that answer as not responsive. The question was what experience he has had and the answer is what the practice has been.

The Court: I will deny the motion. Exception noted.

Q. How long have you been using these button head bolts?

A. Ever since I have been with the Great Northern.

Q. And before that?

A. I think so.

Q. What experience have you had with your oil-burning locomotives?

A. We stripped our first oil-burning engine in 1909, and in 1910 equipped some one hundred or more and since that time we
151 have continued the practice the same as coal.

Q. What is the material in the stay bolts on your oil-burning locomotives?

A. Refined iron.

Q. Does the sketch on plaintiff's Exhibit A, that portion marked 1, show the type of bolt that was used on engine No. 1902 at the time of the explosion?

A. The one to the left?

Q. Yes, sir.

A. Generally, yes, sir.

Q. Did the bolts on that engine have the square on the bottom of the bolt, as shown on that diagram?

A. Not on that engine when she came to us.

Q. At the time of the explosion?

A. No.

Q. How have the button head bolts worked in your experience, satisfactory or otherwise?

A. They have been entirely satisfactory.

Q. Have you had any trouble with them burning off or dropping off or allowing the sheet to drop with water on the sheet, and renewing the bolt?

A. We have not.

Q. Have you made any tests to determine the relative strength of the type of bolt marked No. 1 on Plaintiff's Exhibit A and the type marked No. 3?

A. We have.

Q. I wish you would tell the jury what these were, and say where they came from and what the tests were.

A. Mr. Kelly sent me some bolts from engine No. 1901. We drilled a hole in the sheet, without thread, but the hole large enough to go through the threads so as to pull on the head, and put the other end in a clamp and tried to pull off this head that has been
152 subjected to service something like four years in coal and four years in oil——

Q. Eight years altogether?

A. Yes.

Q. On the particular bolts you tested?

A. The bolt broke, we could not pull off the head. The bolt broke at about 38,000 pounds, corresponding to the original strength of the metal.

Q. That was without the threads?

A. Without the support of the threads, the head only.

Q. That was a test made cold?

A. Yes.

Q. Were they put in oil at the same time this 1902 was?

A. Within a few months.

Q. All right. What other tests?

A. We have taken new bolts forged, head having a wrought head, once, twice, three times; I believe as high as eleven times, cooled them and pulled them the same way and tried to determine if the heating and cooling affected the material; we found it did not, that a bolt such as you see in No. 1 withstood a total stress of about 38,000 pounds. We also tried the type of bolt marked 1 as against the bolt marked 3 cold. Bolts broke in both cases.

Q. At what pressure?

A. 38,000 pounds, or thereabouts. We made other tests of heating, blazing or cutting out a circular sheet and putting it in a clamp—I think the surface was about 4 inches across, the same distance as the spacing of these crown bolts—We heated that sheet around the bolt head as hot as we could get it with an oil flame. Then we put in a pulling machine. We found that when the sheet was hot the
bolt would pull the sheet, destroy the sheet, sort of "dish" it.
153 As that takes place the threads on the upper side of the sheet stretch, showing that they were not in contact with the thread of the bolt.

Q. That is a hole opened up around the bolt on top, due to the dishing effect?

A. Yes.

Q. You might show them the iron you tested.

Q. (Iron exhibited.) What I mean by opening or dishing, this was placed in the clamp. Where it was hot you see the threads are larger at the top than at the bottom, due to this stretching effect. That happened in both cases. The bolt used there had the rivet head.

Q. That is the head of the type No. 3?

A. Yes, No. 3. That is the bolt with the forged head, the same amount of metal as in this originally, except this was riveted. This

was forged. (ind.) This failed by the bolt giving way and the bolt coming out through the head. This failed at a pressure of 11,600. This at 9,200 pounds.

Q. They were red hot at the time?

A. They were heated with an oil flame, in a blast. I do not recall the color.

Q. All right, what other tests, if any? Did you make a test with No. 1 type of bolt head?

A. Yes, that was hot; the other tests were cold tests; the——

Q. The one that pulled at 9,200?

A. 9,200 was the riveted; the 11,600 was the forged head.

Q. That corresponded with No. 1?

A. A similar type. We have made other tests. I recall these. We used an acetylene flame.

Q. Is there anything else in the tests that throws any light on your testimony?

A. (Producing exhibits:) This was another test, heating
154 the bolt with the acetylene flame and stopping the test before the bolts finally gave way. They have been cut off. This is simply to show more or less the dishing effects. This was at 7,000 pounds and this 22,000.

Q. 22,000 with the No. 1 type of bolt and 7,000 with the No. 3 type?

A. 7,200, as I recall. This is to show the effect before they will give way, showing how the top of the sheet stretches.

Q. Did you find that the bolts which had been in service eight years, four years in coal and four years in oil, how did the strength of these bolts compare with the strength of the new heads?

A. We have been unable to pull the head off in both cases; the bolt broke in both cases, the bolt broke.

Q. In both cases the upper part of the bolt broke?

A. Yes, sir.

Q. That is all the tests that you made?

A. That is all the tests I recall.

Q. Have you examined the crown sheet of the engine No. 1902 since the explosion?

A. I have.

Q. This is it, is it, in the court room before the jury?

A. Yes, sir.

Q. Have you examined the bolts and some of the bolt heads which came out of that engine?

A. I have.

Q. Can you tell from an examination of that sheet approximately what the temperature of it was at the time it gave way, or what the minimum temperature must have been?

A. It must have been up to a point where the metal has lost a good deal of its former stability.

Q. Would it have to be red hot to do that?

155 A. From somewhere near red hot—I would say red hot.

Q. Could it get to the temperature which you believe that sheet must have been with water on it?

A. No, sir.

Q. What was the indication on that sheet that leads you to conclude that the temperature must have been as high as that?

A. The quilting effect around the edges.

Q. Won't you step down and point it out to the jurors?

The Court: The jury may step down and see it if they desire.

Mr. Dorety: I would like to have the jury step down and see this while this examination is going on.

(The jury stepped out of the jury box and stood around the crown sheet.)

A. The sheet originally was smooth and practically flat between any four spaces. You notice on the sheet what we call sag or bag. You will notice here (ind.) that it does not have that appearance; and if you will remember or notice the test pieces, that this being the bottom side that we are looking at, that the sheet bags or sags, the threads on top open up and stretch. If you will look at these threads you will find the threads in the sheet intact on the top surface and some pulled through on the bottom.

Q. That is similar to the threads on the burned pieces that you have just showed to the jury?

A. Yes. Besides, you see a good many of these holes that have threads and the material is thin where it stretched the most.

Q. How do you account for the fact that there was no sag in the center of the sheet?

A. The sheet was so hot that when there was no support and it finally came—and this originally was the ridge in it—Do you see it?—it was in what you might call a plastic or pliable shape and it stretched it. This fell here, and with the threads and every-

156 thing, due to this depression, it naturally fell and everything with it.

(By Juror Mrs. Kelly:)

Q. Was that flat once?

A. Yes, it was; not as you see it. Water on this side and fire on this (ind.).

Q. How much longer is it now across this sheet following the line of the middle than it was originally? In other words, how much is the metal stretched?

A. I measured it two or three ways. Measuring from here across to here on the straight side, and then measuring over this bulge it is four inches longer this way. This way (ind.) measuring the same way, about 4-5/8.

Q. From here to here the metal has been stretched out 4 inches and the other way about 4-5/8?

A. Yes, 4-5/8.

Q. That quilting in the middle of the sheet, when would it have taken place, before or after the stretching of the sheet?

A. Before.

Q. It would have taken place before the bolts gave way?

A. Yes.

Q. What would be the effect of the stretching of the metal in both directions, or in that way, have upon the metal?

A. It would tend to stretch it out as you see here.

Q. It was the front end of the crown sheet, the end towards the flue sheets, that is marked with the word "Head" on the other side and as shown, and the other end was toward the cab in the rear of the engine?

A. I will explain the piece removed—which by the way was cut out for inspection — was no different than what you see here. That was cut out nearest the tank end or the door sheet end.

Q. Immediately after the explosion the sheet remained entire without any rupture, the whole sheet, except bolt holes?

A. Yes.

157 Q. And the large square or oblong hole near the rear end of the sheet was cut out for testing?

A. Yes, we have it in the rear room if any one wants to see it.

(By Mr. Zettler:)

Q. Have you all that was cut out?

A. No, the government inspectors took part of it.

Q. What did they have it for?

A. For inspection.

Q. Where did they take it?

A. Washington.

Q. For what purpose?

A. For testing purposes.

(By Mr. Dorety:)

Q. Do you know how the test came out, what the condition of the metal was?

Mr. Zettler: What test have you reference to?

Mr. Dorety: Any tests made of the metal, any tests made by either party, the government or the defendant.

Mr. Zettler: I have no objection if that is based upon the knowledge of the witness.

Mr. Dorety: I will ask him if he has any knowledge.

The Court: He may answer that "Yes" or "No."

Q. Have you any knowledge, personally, as to how the tests came out?

A. Not that I saw.

Q. This small piece is a piece that was cut out?

A. Yes, that was the piece; that was sent to me at St. Paul.

Q. Does that show the same condition of the threads holding together on the upper side of the sheet, on the concave sheet?

A. The same way, this is the fire side and this is the water side.

Mr. Dorety: I would like to have the jury look at the quilting effect from this side also.

Q. While the jury is over here, won't you tell them what is indicated by the pull being around the edges of the holes?

158 (Jury moves to back of crown sheet.)

Q. What does the fact that these are pulled out from the edges indicate as to whether the sheet was hot or cold?

A. It indicates that the sheet was hot.

Q. Is the condition of the threads of these holes, the threads remaining and being stretched on the water side and being stripped away on the fire side, the same as the condition of the iron piece which you tested here?

A. Yes, sir.

(By Juror Maudlin:)

Q. May I ask the witness whether this was the side that the fire was next?

A. I said yes, this is the fire side.

Q. How does the condition of these threads compare with this iron sheet where you pulled the bolts through?

A. The same.

Q. What is the reduction in thickness of the sheet at its thinnest point?

A. It is reduced a little more than $5/16$; between $1/4$ and $5/16$.

Q. How much is that?

A. About $1/8$; a little less than $1/8$.

Q. In your opinion would it be possible to take a plate at the temperature which it would have with water on it and stretch it by a sudden explosion so as to reduce it to that thinness and stretch it to that length with water on the sheet?

A. No, sir.

Q. It would have to be hot to permit of that much?

A. Yes, sir.

Q. In your opinion would the sheet bag that way between holes if it were at the temperature of the water—if it had water over it?

A. No.

Q. What is the weight that this will carry between any four bolts?

159 A. About 3,200 pounds.

Q. Now how much will it carry, how much is it carrying, without taking any permanent sag or bag, that quilted appearance?

A. The bolt or the sheet?

Q. The sheet?

A. At least twice that pressure.

Q. Do you find that the holes of this sheet retain their perfect roundness?

A. They do not.

Q. What has happened to them?

A. They have stretched on account of heat.

Q. They have become flat, some of them?

A. Yes.

Q. In your opinion could they have done that on a cold sheet or a sheet at the temperature of steam or water?

A. No, not at that pressure.

Q. Could this happen to the sheet at the temperature of the water at 200 pounds pressure, which is 380 degrees, is it not?

A. 388, I believe.

Q. How does a sheet at that temperature compare with a sheet absolutely cold?

A. I would say it is about 97 per cent., 97 to 100.

Q. It would be 97 per cent. of its cold strength with the working conditions on it?

A. Yes.

Q. What do the scale conditions of the sheet show—what do you find in reference to that?

A. I find scale on the sides and the part that retains approximately its original shape, and the scale has been removed on that part that has been depressed—bagged.

Q. Step down and show the jury what you mean by scale.

160 A. They will have to look at the inside of the sheet.

(Jury permitted to go around the sheet and look at it again.)

A. The scale has been removed here. That scale forms from the water with the steam and collects, and steam is very much hotter than that.

Q. How does the line where the scale remain— and where it has been removed compare with the line where the sheet gave way?

A. Here is the point where they run very closely.

Q. Will burning or heat remove that scale?

A. It does.

Q. Would it have been removed if the sheet had not been red or to almost a red hot temperature?

A. No, sir.

Q. How do you account for the fact that the evenness of the sheet remains toward the front end and that the scale remains toward the front corners and also that the same remains towards the rear corners, which, according to that indication, was not hot?

A. Below—this is the flat sheet, and some two or three inches below the flat sheet are the bolts—something like my ruler—

Q. Before you finish answering that, is there anything more you want to show the jury from this side?

(By Juror:)

Q. Which is the high part of that?

A. This (ind.) at an elevation of $2\frac{3}{4}$ inches. When it is in position it is about $2\frac{3}{4}$ inches higher here than here.

(By Juror:)

Q. The flue part enters this way?

A. Yes, the arch would be about as you see it there.

(Jury take their seats in jury box.)

Q. Before you proceed to answer that question I will ask you if the sheet of paper that I am holding in my hand, which is arched from side to side, and slanting from my right hand up towards my

left hand, represents in an exaggerated way the arch of this crown sheet over the fire box?

161 A. Yes.

Q. Will you show the jury about where the water line would be, what would be the arch of the water line as it extends over the crown sheet?

A. (Witness indicates with pointer.)

Q. Will you draw that with your pencil?

A. (Witness draws line.)

Q. The portion below and the lower end towards my right hand indicates the portion that would be covered with water?

A. Yes, sir.

Q. And the other portion that would be bare?

A. Yes.

Q. Will you point out to the jury on the crown sheet itself the portion corresponding to what is shown here (on diagram) as being covered with water?

A. (Witness indicates.)

Q. Would the presence of the water at the rear end account for the bolts remaining and the scale disappearing?

A. Yes.

Q. How do you account for the bolts holding along the front row and the two front corners and the scale remaining there?

A. Below the crown sheet are the flues by which the engine is driven.

Q. How is the engine driven?

A. The locomotive is driven by using the steam exhausted from the cylinders—the cylinder is not shown passing up from the stack. There are drive pipes in around here (ind.) so that the action of this steam going through the pipes forms a syphon across the burner, a vacuum, holds the fire and takes off the process of combustion.

Q. The flues are what?

A. Pipes

162 Q. Pipes?

A. Pipes about 2 inches in diameter.

Q. Running where?

A. From the flue sheet here (ind.), from the back flue sheet to the front flue sheet down at the front end.

Q. And the exhaust of the steam seeks air from where?

A. Sucks the gases and the production of combustion from the fire box.

Q. Through the flues?

A. Yes.

Q. And up the flue stacks?

A. Yes.

Q. Will you go on with your explanation of why the corners were not so hot?

A. The engine was rolling. There was motion all through this engine. The oil flame is directed through the draft or against the door sheet, and the draft pulling forward gives what we call a

"Roll" to the burning oil. As it gets nearer the flue sheet the draught tends to deflect the gases as well as the heat to the flues, and further evaporation takes place in the flues. The draught protects the front corner, the front end of the crown sheet, due to the pull down to the flues.

Q. Will you again indicate on the drawing the course of the flames. Will you put a B to indicate the position of the burner?

A. (Witness places B on drawing.)

Q. Will you explain again?

A. B shows the burner, the oil coming through the burner, and getting spread over this little passage—I have shown the outline—and turns backward at the bottom of the fire box and against the door sheet wall of the fire box. Of course, the several arrows show the direction. This passage here (ind.) sometimes that is not as prominent as shown there.

163 Q. At the point marked D there is a deflecting ledge extending out from the back wall?

A. For the boiler end. Then it is rolled over and strikes the crown sheet, some of it, back here, and is carried off then by the draught of the flues.

Q. Where is the hottest part of the crown sheet? Where is it most exposed to the flame?

A. It depends on the draught of the engine. Usually along towards the center of the sheet.

Q. How much below the crown sheet at the front end is the highest flue?

A. I think about $2\frac{1}{2}$ inches.

Q. At the top of the flue?

A. That is 2 inches below. The center of the flue is from $2\frac{1}{2}$ to 3 inches below, at the center of the flue.

Q. What is the effect of that gas being drawn to the flues, on the forward part of the sheet?

A. It leaves the corners there and so they are not as hot as at other points.

Q. After the water once gets to the level of the highest part of the crown sheet so that the highest part of the crown sheet was bare at the water's edge, how long would it take it to drop down to the position that you indicate on that drawing, or as indicated on the sheet itself? How far would it have to drop first from the highest point of the sheet to a place within a foot or two of the lowest one?

A. It has been given at about 6 minutes and I think that would be correct provided we knew how much water was being forced in the boiler.

Q. About how much would it have to go down to expose that portion of the sheet indicated on the drawing? In other words, how much lower is that?

164 A. I think this will be probably $2\frac{3}{4}$, and the engine was working on a grade, and that left it about 2 inches more, so it would have to go down about 4 to $4\frac{7}{8}$.

Q. It would take 5 or 6 minutes to do that assuming that water was not being fed into the boiler?

A. Yes, sir.

Q. If the sheet had been pulled down cold, Mr. Hawkins, or if the temperature of the same was 380 degrees, what would you expect to find as to the condition of the threads?

A. I would not expect to find them stripped.

Q. Would you expect to find them stripped as they are in this sheet?

A. No.

Q. Is your use of button heads confined to engines that were built that way for coal burners or are you installing button heads now on engines built for oil burners?

A. That is still our custom.

Cross-examination.

Mr. McCabe:

Q. You are still superintendent of motive power for the Great Northern Railway?

A. Yes.

Q. Did you have charge of the engines when they were changed from coal to oil?

A. Yes, except 1905, the first one out.

Q. Who would the company hold responsible if the crown bolts used on this engine are bad, who would be at fault?

A. They would hold me.

Redirect:

Q. How did the 1905 happen to be fitted up before the others?

A. We had a hard time to get coal of the proper quality on the Coast. They equipped that engine primarily to tell whether it was cheaper to burn oil than coal.

165 Q. This do you intend to say—Was she equipped with button head bolts?

A. Yes.

Q. Then you had made a test of that type of bolt before you equipped the 1902 and the other engines?

A. No, we had not time to test the bolt in oil, but we had used the bolt and knew of the results we were getting in coal.

Q. By making a test I mean in actual operation? You have used the button head in oil before you installed them in other engines?

A. Yes.

Q. For how long?

A. About a year.

Witness excused.

166 S. CORRIGAN, called as a witness on behalf of the defendant, being first sworn, testified as follows:

Mr. Dorety:

Q. Where do you reside?

A. Everett.

Q. What is your business?

A. Train master of the Great Northern Railway.

Q. Where were you on November 5, 1913, the morning at the time of this explosion?

A. I was on the train at the time.

Q. Did you go up to the engine after the explosion?

A. I did.

Q. Did you pick up any of the heads of the bolts which had fallen off?

A. I did.

Q. I will ask you if you would recognize the bolt composed of defendant's exhibits 2 and 4, the whole of the bolt head?

A. Yes, sir.

Q. And the bolt marked defendant's Exhibit 3?

A. Yes.

Q. And the portion of the bolt marked defendant's Exhibit 5?

A. Yes, sir.

Q. Were these bolts that were picked up by you from that engine?

A. Yes.

Mr. Dorety: I offer these in evidence.

Mr. Zettler: May I ask two or three questions in regard to these at this time?

The Court: You may.

Q. Do you know of your own knowledge how long these particular bolts had been installed?

167 A. No, sir.

Q. You don't know whether they were installed two or three days before or five years before?

A. No, sir.

Q. Do you know from what portion of the crown sheet these particular bolts came, to your own knowledge?

A. That would be an impossibility.

Q. You don't know?

A. No.

Mr. Zettler: No objection.

The Court: They may be received.

MICHAEL FLANNIGAN, called as a witness on behalf of the defendant, being first duly sworn, testified as follows:

Direct examination.

Mr. Dorety:

Q. Where do you live?

A. 1507 Colby.

Q. Everett?

A. Everett.

Q. What is your business?

A. Master mechanic of the Cascade Division.

Q. Of the Great Northern?

A. Great Northern.

Q. Did you recently remove some crown bolts from one of your 1900 engines and deliver them to me?

A. Yes, sir.

Q. In what shape did you deliver them?

A. Well I delivered them planed off on the side of the button head and also slit through the center.

Q. What engine did you take them out of?

168 A. Out of 1904.

Q. You removed the bolt, planed off the head in about the shape that I show you here?

A. Yes, sir.

Q. And split them down the center in about the manner indicated by the bolt I hold in my hand?

A. Yes, sir.

Cross-examination.

Mr. McCabe:

Q. You are still an employe of the Great Northern?

A. Yes.

Q. You have gone over all this testimony with Mr. Dorety?

A. No, sir.

(Witness excused.)

DANIEL O'LEARY, called as a witness by the defendant, sworn and testified as follows:

Direct examination.

By Mr. Dorety:

Q. Where do you reside?

A. Seattle.

Q. What is your business?

A. Master mechanic of the Columbia & Puget Sound Railroad.

Q. So you have charge of their engine shops?

A. I do.

Q. Did you recently have cut from the bolt head which I show

you marked defendant's Exhibit No. 5 some discs of the metal in the bolt?

A. Yes.

Q. What did you mark them with? How did you mark them, if at all? Did you mark them with a mark corresponding with what is on here?

169 A. Yes, they are marked the same.

Q. That is T-2?

A. The discs are. T-2—L-2.

Q. What do T and L indicate?

A. This transverse section; L is longitudinal.

Q. The transverse section was taken running across?

A. Yes.

Q. And the longitudinal section was taken running up and down?

A. Yes.

Q. Both out of the bolt marked Exhibit 5?

A. Yes.

Q. Did you receive from me a portion of the bolt cut formerly in that shape with a request to make some discs from it?

A. Yes, sir.

Q. Do you remember what you marked those discs?

A. T1-L-1.

Q. The L and T to indicate longitudinal and transverse as in the other?

A. Yes.

Q. Did you or anybody else have this in your shop making a test to determine the effect of heating the head of a bolt of the type shown as No. 1 on Plaintiff's Exhibit A?

A. I did.

Q. Will you tell the jury what equipment and apparatus you used to make the test, what the test was.

A. There was a box made of boiler iron, about 2 feet long, and a little over a foot wide, and six bolts were screwed up through the bottom of the box. Then we set that box on top of brick and made a kind of a brick furnace with this box set on top of it, and then an oil flame was put into this furnace for about an hour—

170 Q. What did you produce the oil flame with?

A. Oil and air.

Q. What is the name of the apparatus which you used?

A. Oil burner.

Q. Is it operated on, primarily, the principle of the oil burning locomotive?

A. The same principle, only instead of using steam for atomizer we had an atomizer of air.

Q. Is it as hot a flame as you are able to produce except by an ox-acetylene flame?

A. It is.

Q. Was the flame from this torch blown out with tremendous force and with a loud rushing noise, so loud you cannot hear yourself speak?

Mr. Zettler: I object to the question as leading.

The Court: I think it is. Exception allowed.

Q. Any how you kept this flame on the box for an hour about with water in the box?

A. Yes, water in the box?

Q. What was the effect on the heads of the bolts when the flame was removed?

A. Nothing more than warming them up.

A. Were they red hot?

A. No.

Q. Would they ignite a pine stick?

A. No.

Q. Would this torch be hot enough to melt iron if it were unprotected by water?

A. Yes, we melt frames with them. We take a 4-inch frame and put them up and put the flaming torch to the one with the 2-inch frames right together, 4 inches square.

Q. It would melt them?

171 A. Yes.

Q. Did you afterwards make any other tests with a different kind of a flame on these heads?

A. We put the ox-acetylene on the ends of the heads and burned the ends of the heads on two of the bolts.

Q. How hot is ox-acetylene flame?

A. They claim it to be 6,000 degrees.

Q. Tell the jury what it will do, for instance, if you put it against a piece of boiler plate a quarter of an inch thick with water on the other side, what would be the result?

A. I never tried that, with water on the other side.

Q. You don't know whether it would affect the metal or not?

A. It would burn the metal through all right, but I never tried it with water on the other side.

Q. How large is the flame?

A. It is as big around as my finger.

Q. Have you directed it against a piece of metal half an inch thick, a piece of steel? What is the result?

A. It will go right through it.

Q. In about how long?

A. In 3 or 4 minutes you can cut out 5 or 6 inches.

Q. Is it the hottest flame known to machinists?

A. It is the hottest flame used by practical machinists around machine shops.

Q. I will ask you if you recognize two portions of bolts marked defendant's Exhibit 6 and 7 as two of the bolts that were in that box, that is they are marked on top as exhibits 6 and 7?

A. Yes, we marked them 4 and 5. They are the bolts.

Q. These bolts had this oil torch directed against them for an hour with water over them?

A. They are the bolts burned by acetylene.

Q. Were they also in the box?

172 A. Yes, and put on the ox-acetylene. These are the bolts that were put in the box that we put the oil flame against.

Q. That is had the oil flame on with the water and then the ox-acetylene flame with water?

A. Yes.

Q. Did you make discs from these?

A. We did.

Q. And what did you mark them?

A. Just the same as the bolt. That bolt was marked T-5—L-5; and from the other bolt was marked T-4—L-4.

Cross-examination.

Mr. McCabe:

Q. The line you are the master mechanic of is 23 or 24 miles long?

A. A little bit longer.

Q. Do you know of your own knowledge whether or not those bolts came out of the crown sheet of engine No. 1902?

A. No.

Q. Have you had experience in oil burners on your line?

A. No.

Q. You belong to the Master Boiler Makers' Association?

A. Yes.

Q. And officials of the Great Northern also belong to that association?

A. Yes, as far as I know. I am not sure about that.

(Witness excused.)

JOSEPH DANIELS, called as a witness by the defendant, sworn, and testified as follows:

Mr. Dorety:

Q. Where do you live, Mr. Daniels?

A. Seattle.

173 Q. What position do you occupy?

A. Assistant Professor of Metallurgy and Mineralogy at the State University.

Q. What has been your technical training?

A. I am a graduate of the University of Memphis, Institute of Technology and of Lehigh University.

Q. What is your branch of instruction at the University of Washington?

A. My instruction is in metal, mining and in iron and steel.

Q. Have you had some experience in testing iron and steel?

A. I have.

Q. Did you receive from Mr. O'Leary some discs of metal marked T-1, L-1; T-2; L-2; T-4; and T-5, L-5?

A. I did.

Q. What tests did you make of them?

A. We took the small discs and very carefully ground them down on emery and a finishing process until the specimens were polished as smooth and bright as it is possible to get metal; in other words, they were practically mirror surface. Then these specimens were placed in a solution of chemicals which is the best test recommended by the American Society for Testing Metal for Stay Bolt Iron.

Q. Is that considered the highest authority?

A. That is considered the standard authority for commercial test of that kind. Then these specimens were placed under the field of a metallagraphic microscope. The specimen enters the microscope through one side and passes down through the top of the microscope through a bare surface which has been etched, and then passes back in the eye piece of the microscope; and in that way we are able to study the surface of the specimen.

Q. Does that test indicate in a practical way the strength
174 and structure of the metal and would it show whether or not it was crystalized?

A. It does.

Q. Would it indicate any weakness in the structure of the metal, if there was any?

A. Positively.

Q. Is it a test used in practice in testing metal in bolt machinery and so on?

A. Yes.

Q. What was the result of your tests on the discs which I mentioned?

A. We found with the etching—I found that the specimens were always uniformly homogeneous in structure; that the material was wrought iron of high grade and that there were no flaws or weaknesses of any kind.

Q. Is that true of all the specimens that we furnished you?

A. Yes, true of all of them; they were uniformly homogeneous.

Q. Did you make some photographs along the line of this testimony?

A. Yes, I did.

Q. Will you produce the discs that you tested and photographed?
(Produces box containing discs.)

Q. I am assuming that the discs in this box marked defendant's Exhibit 8 are the discs you refer to?

A. Yes, they are.

Mr. Dorety: I will offer them in evidence.

Mr. Zettler: No objection.

The Court: They may be received.

Q. Have you the photographs which you took?

A. I have. (Produces photographs.)

Q. The photographs which I will place in this envelope and which are marked Sample T-1, Sample T-2, Sample T4 and Sample T5; Sample L-1, Sample L-2, Sample L4 and Sample L5 are photographs taken of those discs?

A. They are.

175 Mr. Dorety: I will offer them in evidence.

Mr. Zettler: No objection.

The Court: They may be received.

Q. What temperature is necessary to melt iron?

A. 1500 degrees centigrade which is equivalent to 2700 degrees or more Fahrenheit.

Cross-examination.

Mr. McCabe:

Q. What is your age?

A. 30.

Q. Have you any personal knowledge of where the samples of these bolts came from?

A. I have not.

Q. How much are you receiving from the Great Northern for testifying?

A. I have not received anything.

Q. How much are you agreeing to accept?

A. I have not agreed to accept a dollar.

Q. Do you make a practice of going around the country testifying free of charge?

A. No, I do not.

Q. Are you connected with the Great Northern in any manner?

A. No, I am not.

Q. Do you expect to receive any compensation?

A. I do not.

(Mr. D.:)

Q. Have you any hopes?

A. I have some hopes.

(By Mr. McCabe:)

Q. In reference to what do your hopes lie?

A. I do not understand your question.

176 JOHN DIXON, called as a witness by the defendant, sworn, and testified as follows:

Direct examination.

Mr. Dorety:

Q. Where do you reside, Mr. Dixon?

A. At Vancouver, Washington.

Q. What is your position?

A. General master mechanic of the Spokane, Portland & Seattle, the Spokane Island, the Oregon Trunk Railway, Oregon Electric United Railways.

Q. What are your duties as general master mechanic?

A. I am in charge of the mechanical department of all these railroads.

Q. What has been your technical training and mechanical experience?

A. I was educated in the ordinary schools and then went to the university extension school in the University of Minnesota after which I was apprenticed as a machinist; worked as a machinist at different places for a number of years; was then draftsman for the Great Northern Railway; left the Great Northern Railway and was instructor in mechanics in the ordinary high school in Seattle; left and then became general ordinary track instructor for the Great Northern; was then made superintendent of shops for the Great Northern at Everett, Washington; then master mechanic of the Dakota Division of the Great Northern where I was for four years, after which I came to the Spokane, Seattle & Portland as master mechanic which position I filled until the 1st of February of this year when I became general master mechanic.

Q. What type of crown bolt is in use on your road?

Mr. Zettler: I object to that on the ground it is not permissible to show what is used on specific roads. The Great Northern
177 Railroad cannot excuse itself because a specific road uses a different bolt head. He may show the general custom. That I think is well settled.

Mr. Dorey: I will state that my object in asking the question is to qualify him as an expert on button heads.

The Court: He may answer that. Exception noted.

A. The button head type of crown bolt.

Q. How long has it been in use?

A. We have had button head crown bolts ever since the road opened in 1908.

Q. Are you using them on oil-burning locomotives?

A. Yes, sir.

Q. What has been your experience with them? How do they work?

A. It has been good.

Q. Have you had any drop off or have had the crown sheet fail with water on it?

A. No, sir.

Q. How would a bolt of that sort, in your opinion, compare in strength with a bolt of the type of No 3 on Plaintiff's Exhibit A?

A. I believe it compares better in strength than the other.

Q. That the button head is stronger?

A. The button head is the stronger.

Q. From your experience would you say, in your opinion, it is possible to burn the button head off the crown bolt with water on the sheet?

A. No, sir.

Q. Is it possible for it to be forced off by the pressure in the boiler.

A. No.

Q. Are you still putting them on new engines that you use?

A. Yes, sir.

178 Q. Engines that are built to use with oil burners?

A. Yes, sir.

Q. Have you examined the crown sheet from engine 1902?

A. I have.

Q. From your examination of that sheet what is your opinion as to the condition of the sheet, the temperature of it, at the time it went down?

A. I would say it was hot.

Q. How hot?

A. Red hot.

Q. What indications on that do you find?

A. I would base my judgment on the manner in which the sheet is stretched and from the fact that threads remain in the holes where the crown bolts were and the manner in which the holes are stretched.

Q. How would the sheet be, in what condition would it be in those respects, if forced down when cold or at a temperature that it would be with water on it?

A. The sheet would be spread between the holes whereas now it is bagged, and the threads would not be stripped out. I mean they would be stripped out.

Q. The threads would be stripped out if the sheet had dropped when cool or at the temperature of the water?

A. Yes.

Q. Do you use fusible plugs on your road?

A. No, sir.

Mr. Zettler: I object on the ground it is not proper.

The Court: I do not see the competency of the question. Exception.

Q. Have you had any experience with fusible plugs?

A. No.

Q. Are you familiar with their work on other roads from reports and discussions and literature on the subject?

179 A. Yes, sir.

Q. In your opinion do they tend to eliminate accidents?

A. No.

Cross-examination.

Mr. McCabe:

Q. You are still an employe of the Spokane, Portland & Seattle line?

A. I am.

Q. What connection has your line with the Great Northern?

A. I don't know.

Q. This is the highest point on the crown sheet (ind. on plat)?

A. Yes.

Q. How many inches higher is this point than the point back here, the lowest point?

A. I don't know of my own knowledge.

Q. The drawing says 3 inches?

A. Well.

Q. The engine was working on a 2.2 per cent grade; this point of the crown sheet is 3 inches higher than the back portion when she is

level; and we are on a grade of 2.2 per cent, and the length of this crown sheet being about 90 inches would raise it up 1.9 or nearly 5 inches higher in front than it was behind, what portion, assuming my statement is correct, in this crown sheet would first become bare?

A. In the center at the forward end.

Q. That would be along here (ind.)?

A. Yes.

Q. You have heard the testimony here of how many gallons of water it would take to fill the space from here to here (ind.), 2400 gallons. You heard that, Mr. Dixon, did you not?

A. I believe I did.

Q. Assuming the engine is using 4,000 gallons per hour, 180 how long a time, if you know, would it be from the time the highest point here, the highest point on the crown sheet became bare until the lowest point bare, with the injector shut off, approximately?

A. Well, I should say from 4 to 5 minutes.

Q. From 4 to 5 minutes?

A. That is only an estimate; I have not calculated it. I don't know positively; that is a guess.

Q. Assuming that you are correct, this sheet, exposed to a flame of 3,000 to 3,500 degrees of heat, would take how long to become soft, so that the sheet would pull over the heads of the crown bolts?

A. Well with the vapor of the steam above it I would not say; I have not tried that to know.

Q. How do you account for the fact, Mr. Dixon that the rivets at the highest point on the crown sheet shows absolutely no signs of heat?

A. I don't think they do.

Q. You are correct, they do not.

Q. I think they show signs of heat.

Q. The Spokane, Portland & Seattle line is, as you well know, a portion of the system of the Great Northern and under the management of the chairman of the board of directors of the Great Northern?

A. I have no personal knowledge to that effect. I have heard say, but I have no positive evidence that would make me know positively that it is.

Q. You know that Mr. Hill, James J. Hill, is chairman of the board of directors of the Great Northern for a good many years, and Louis Hill was afterwards appointed. You always recognized, during the time you worked on the Spokane, Portland & Seattle, Mr. Hill to be your boss, is that true?

181 A. I never worked for them that way.

Q. I asked you if that is true or not? Is that true or is it not?

A. Well, I can only go by hearsay.

Q. Answer the question yes or no.

Mr. Dorety: I object to it.

A. I have said that I have no positive knowledge to that effect or otherwise, I cannot say except by hearsay.

Q. What is your belief, Mr. Dixon?

Mr. Dorety: I object to the question.

The Court: That is sustained. Exception noted.

Q. You know that at the time the Spokane, Portland & Seattle was taken over by the board of directors that Great Northern employees were given an option of going down there and going to work?

Mr. Dorety: I object, it is incompetent, irrelevant and immaterial.

The Court: I think it is. Exception noted.

Q. You belong to the Master Machinists' Association?

A. No, sir.

Q. Whom did you go over this testimony with?

A. Whom? Mr. Davis of the Northern Pacific and Mr. Hinckley of the Oregon Short line.

Q. And Mr. Dorety, of the Great Northern?

A. He was there.

Redirect examination:

Q. Mr. McCabe asked you what would be the effect on this crown sheet exposed to heat of from 3,000 to 3,500 degrees. Do you know whether, as a matter of fact, it is exposed to that heat in a fire box of an oil burning locomotive

A. I never heard of such a high temperature before.

Q. Have you heard of any tests which would determine it?

182 A. Yes.

Q. What is it?

A. From 2,200 to 2,500 degrees is what I have been used to understand.

Q. That is in an oil burning locomotive?

A. Yes.

Q. You spoke of not knowing how hot the center might get with the steam. What is the temperature of steam under 200 pounds' pressure?

A. 383 degrees.

Q. The temperature of the steam is practically the same as the temperature of the water?

A. Yes, the upper surface of the water.

Q. When the metal of the crown sheet becomes bare of water in the position that it is in the engine, would there still be water on the front of the side seams?

A. I should judge there would from the course of that sheet. I have not measured it off to know positively.

Q. But it is a fact that the farthest line of water seeks back on the engine is along the center of the ridge of the crown sheet? This shape of the sheet shows that and the course of the water line would be what shape?

A. Well, it would be more of a curvature. It would cross at the

back and gradually extend toward the back increasing the width at the front as the water got lower.

Q. About the shape I indicate with my pencil?

A. Yes.

Q. And then a little further back?

A. Yes.

Q. And as the water receded a part of the front seam would still be protected by water?

A. It is.

183 Q. Is it a fact that this portion of the sheet, that the *the* front portion nearest the flue sheet, is as much exposed to heat in the fire box as the center of the crown sheet?

A. No.

Q. Why not?

A. Due to the draft that enters the flues.

(Witness excused.)

(Court adjourned for 10 minutes recess.)

WILLIAM KELLY, a witness called on behalf of the defendant, being first duly sworn, testified as follows:

Direct examination.

Mr. Dorety:

Q. Where do you reside?

A. Spokane.

Q. What is your position?

A. General master mechanic for the Great Northern.

Q. Held the same position at the time of this explosion?

A. Yes, sir.

Q. How soon after the explosion did you examine this engine?

A. In about 10 hours later.

Q. Where were you at the time of the explosion?

A. Coming west on No. 1.

Q. What condition did you find the crown sheet in as compared to what it is now?

A. Well, it was in about the same condition that it is *not*. It was in the fire box and I examined it first in the night with a torch and I noticed as much as I could with the light, and later in day light with the others. I found the flue sheet seam, that is the top seam, separated from the crown sheet.

Q. That is the seam at this end of the crown sheet which is
184 marked "Head?"

A. Yes.

Q. That was separated from the crown sheet?

A. The flue sheet had separated from that.

Q. That is at the point which is marked with an X on the diagram?

A. Right there.

Q. What else?

A. The top row of flues from here (ind.), those flues across the

top, and each one of these for about half way down, the calking of the head had pulled away from the sheet so you could see it was separated.

Q. Could you determine from that the height of the water at the time of the explosion?

A. In my opinion that was the exact height of the water, the mark on these bolts.

Q. That was about the center of the top flue?

A. It was just about the center on the top row of flues which consists of this course on top of the sheet.

Q. And that is how far from the top of the crown sheet at its highest point?

A. I would say about 3 inches.

Q. With the water at that point would it still cool the sheet, the water running up with reference to the oval corners on the crown sheet?

A. It would be just about at the corners of the crown sheet.

Q. A line drawn from that corner to that corner on the crown sheet would be right about 3 inches from that line (ind.)?

A. Yes.

Q. Now these flues or pipes which run from the boiler are attached to this flue sheet in what way?

A. With a roll in there and beaded.

Q. Out through holes in the flue sheet?

185 A. Yes, and the hole beaded in so it rolls so much against the copper sheath and it is beaded over to keep that tight.

Q. What pulled out?

A. The beading from the top half of the six top flues.

Q. What was the color of the sheet at the time you examined it?

A. The sheet was blue and was pulled, quite a portion of it.

Q. About what portion of it?

A. Most of the portion that is bent down.

Q. What was the condition of the bolts, crown bolts, as to color?

A. The crown bolts—the first night I could not see them on account of night—it pulled quite a lot in there. I could not see them distinctly, but when I looked in there in day light I could see that they were blue and looked to be from an inch to 2 inches above where they were through into the sheet.

Q. What would you conclude from that?

A. That they were overheated.

Cross-examination.

Mr. McCabe:

Q. You are still general master mechanic of the western district of the Great Northern Railway Company, Mr. Kelly?

A. Yes.

Q. All of the oil burning engines of the Great Northern are under your jurisdiction?

A. Yes.

Q. When the change was made from coal to oil you were then general master mechanic?

A. Yes.

Q. You were responsible for the change, were you, Mr. Kelly?

A. It was a question of money and fuel.

Q. The change was made largely upon your recommendation?

A. Well, I went to the Southern Pacific and looked over their oil-burners with Mr. Emmerson, and on our return we recommended that we try oil.

186 Q. You recommended it upon your return?

A. Yes.

Q. You belong to the Master Machinists or Master Mechanics Association, Mr. Kelly?

A. Yes.

Mr. O'LEARY recalled for further direct examination.

Q. Mr. O'Leary, did you examine this sheet of this engine after the accident?

A. I did.

Q. About how long afterwards?

A. The morning of November 7. I think it was the morning right after the explosion.

Q. When you made the examination what was the color of the sheet?

A. There was quite a part of it that was blue.

Cross-examination.

Mr. Zettler:

Q. You have talked with Mr. Dorety in reference to this examination have you not, Mr. O'Leary?

A. Yes.

(Witness excused.)

C. F. FOLEY, called as a witness by the defendant, sworn and testified:

Direct examination.

Mr. Dorety:

Q. Where do you live?

A. Spokane.

Q. What is your business?

A. Foreman Boiler Maker.

Q. Great Northern?

A. Yes.

Q. Did you examine this engine soon after the accident?

A. Yes, sir.

Q. How soon?

187 A. On the 7th of November. I believe it was about two days after the accident. 1913.

Q. What was the color of the sheet at that time?

A. A portion of it was blue color.

Q. What was the color of the bolts?

A. Blue.

Q. To what extent?

A. I should say from the end of the thread to the end of the bolt where it pulled through the sheet there; an inch to 2 inches.

Q. What was the condition of the flues in the flue sheets?

A. Well, the three top flues on each side of the center was badly sprung, and bent.

Q. The upper half of the flues?

A. Yes, that would be the six top flues.

Q. In your opinion could the water line at the time of the explosion be ascertained from that?

A. Yes.

Q. Where would you say the water line was?

A. It was shown on the sheet there to the end of the overheated portion.

Q. I mean the water line on the flue sheet?

A. Possibly 2 or 3 inches.

Q. Below the top?

A. Yes.

Cross-examination.

Mr. McCabe:

Q. You are in the employ of the Great Northern at the present time?

A. Yes.

Q. Do you wish to continue in their service?

A. Yes.

(Witness excused.)

188 RALPH W. PAULSON, called as a witness on behalf of the defendant, being first duly sworn, testified as follows:

Direct examination.

Mr. Dorety:

Q. Where do you live?

A. Seattle.

Q. What is your business?

A. Boiler inspector for the Hartford Steam Boiler Insurance Co.

Q. How many years' experience have you had in boiler works?

A. Well, a little bit over two years with the Hartford and I worked about fifteen years off and on in the engine department as machinist.

Q. Did you see the crown sheet of engine No. 1902 soon after the explosion?

A. I did.

Q. About how soon?

A. Well I happened to be in the locality down around Everett, and as she had come in Everett, come in the yard, of course, I was seeking information for my own personal benefit.

Q. About how long after the explosion was it, do you know?

A. Well, I should judge that would be about two days, something like that.

Q. Did you look into the fire box?

A. I did.

Q. Did you look at the crown sheet?

A. I did.

Q. That was on your own initiative? Not on anybody's request?

A. Yes, for my own personal benefit.

Q. What was the color of the sheet when you looked at it?

A. It was a darkish blue, just a shade on the dark.

Q. In your opinion and from your experience is that a color that can get on the sheet when there is water on it?

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A. No, sir.

Q. Have you made an examination of this sheet since?

A. No, sir.

Q. From what you saw what would be your opinion as to whether or not there was water on the crown sheet at the time of the explosion?

A. Well, the temperature of the metal at the time I looked at it. Of course, I would have to look over the sheet now.

Q. What would you say?

A. I say if the sheet was not overheated why the metal would not bag and stretch in such a portion of that while cool or at a cooler temperature.

Q. Calling your attention to the end of the bolt head marked Defendant's Exhibit No. 3, have you examined that before?

A. Yes, sir.

Q. From the condition of that what would you say as to whether or not it had been protected by water or not at the time it broke off?

A. I should say it was not being protected by water.

Q. Why not?

A. Because the color of the metal is blue which signifies that it has not been protected.

Cross-examination.

Mr. Zettler:

Q. What has become of the blue color on this crown sheet?

A. The blue color on that crown sheet is merely a scale on the metal.

Q. What has become of that color?

A. That color disappears with age.

Q. Without being used?

A. Yes, sir.

190 Q. How much are you receiving from the Great Northern for this testimony?

A. Nothing.

Q. Whom did you go over this testimony with other than Mr. Dorety?

A. I didn't go over it with anybody.

Q. Not even Mr. Dorety?

A. Mr. Dorety just asked me if I was near there and I told him yes.

Q. Near where?

A. Down here to see the boiler.

Redirect examination:

Q. The reason of this blue color disappearing, is it customary where it is desired to retain that blue color to coat the sheet with anything? Do you know anything about that?

(By Mr. Zettler:)

Q. If you know anything about that? Q. Do you know whether or not there are means adopted to preserve that color?

Q. Do you know whether or not there are means adopted to preserve that color?

A. I believe there is.

Q. What is it?

A. The way they temper it?

Q. I mean if the sheet has been burned and is blue and it is desired to keep that blue color in it for some reason, is there any coating which can be put on it for that purpose?

A. No, I don't think so.

(Witness excused.)

JOHN BRENNAN, called as a witness by the defendant, sworn and testified:

Direct examination.

Mr. Dorety:

Q. What is your residence?

A. 1315 East Grand.

191 Q. What is your business?

A. Foreman boiler maker.

Q. For the Great Northern Railroad Company?

A. Yes.

Q. Here in Everett?

A. Yes, sir.

Q. Did you remove some bolts from engine No. 1902 after the explosion?

A. Yes, sir.

Q. I will ask you if the bolts lying here in this sack by the crown sheet are the bolts that were removed from that engine?

A. Yes, sir.

Q. Did you examine the flue sheet and flues after the explosion?

A. Yes.

Q. What condition did you find?

A. Found the top row heads sprung away from the sheet.

Q. The top part of the top row that would be this?

A. Rows across.

Q. In your opinion would that indicate heat or not?

A. It would, yes.

Q. Would you say it would happen with water up over the flues?

A. No, sir.

Q. If water were over the crown sheet it would have to be over the flues.

A. Yes, sir.

Q. The bolts in this sack, what are they?

A. They are the 1902 bolts.

Q. Were they also removed after the explosion?

A. Yes, sir.

Q. Calling your attention to the distance between threads toward the lower end of the bolts being greater than the distance on the upper end and the fact that the bolts seem to be thinned out towards the lower end, what would that condition indicate to you as having been hot or not?

A. It would indicate that there was low water. The threads in the sheet pulled off the bolt.

Q. Would the bolt stretch in that way with water upon it?

A. No, sir.

Q. The sack that you have been referring to is a sack with a tag marked defendant's Exhibit 10 and containing 10 bolts?

A. Yes.

Mr. Dorety: I will offer defendant's Exhibit 10 in evidence.

Mr. Zettler: No objection.

The Court: It may be received.

Cross-examination.

Mr. McCabe:

Q. Where are the other 200 bolts?

A. At my office at the boiler shop.

Q. Do you know what portion of the engine No. 1902 these bolts were taken out of?

A. They come out of the center because the side row was not changed.

Q. You don't know whether they come out of here or there (ind.)?

A. No.

Q. You are still in the employ of the Great Northern?

A. Yes, sir.

Redirect examination:

Q. Did you receive any request from Mrs. Donaldson or her attorneys to bring any of the other bolts?

A. No, sir.

(Witness excused.)

193 JAMES T. JOHNSTON, called as a witness by the defendant, sworn and testified.

Direct examination.

Mr. Dorety:

Q. What is your place of residence?

A. 1387 West 30th street, Los Angeles, California.

Q. What is your business?

A. Boiler inspector of the A. T. & S. F. Railway Company.

Q. That is what is popularly known as the Santa Fe?

A. Yes, it is best known as the Los Angeles line, eastern and western lines.

Q. You also have an official position in connection with some organization of boiler experts?

A. I was recently elected president of the Master Boiler Makers' Association.

Q. That is of the United States?

A. United States—It is International—and Canada. International Master Boiler Makers' Association.

Q. What has been your railroad experience?

A. On the 9th day of June, 1875, I started in the boiler making business for the Pennsylvania Railway Company, serving until 1885, with the exception of one or two excursions out in the country and located at different points—possibly a period of six months. In 1885 took a position with the Northern Pacific at St. Paul, Minnesota, working for that company until 1904, when I was made foreman of the A. T. & S. F. at Albuquerque, New Mexico, working in that capacity until January 1, 1907, when I was appointed boiler inspector in charge of the coast lines and am still in that present position.

Q. What experience, if any, have you had with button head crown bolts on oil burning engines?

A. At the present time we have a number of button head
194 bolts in service?

Mr. Zettler: I understand the question to be, have you had any experience?

A. Ten years.

The Court: The question is: What experience have you had?

Q. You have them at the present time on oil burning locomotives on your line?

A. Both with the taper and button head in oil burning engines.

Q. How long have you been burning oil on the Santa Fe?

A. Ever since, on the coast lines, ever since I took a position with the company.

Q. That has been ten years?

A. Ten years.

Q. What is the longest time that you have had button head crown bolts in service without changing them on oil burning locomotives?

A. I have applied button head bolts during the year 1905 and they are still in service.

Q. Have you ever had one of them drop off or have you ever had a crown sheet drop with button head bolts where there was water on the sheet?

A. No, sir.

Q. What has been your experience with them in general as to whether they are satisfactory or not?

A. Well, we cannot see any difference in the service the bolt gives any more than the method of applying.

Q. Are you familiar with the use of button heads on other roads through discussion, literature or otherwise?

A. On the Pennsylvania and other roads and the Northern Pacific.

Q. From what you know, experience with them in general, are they satisfactory or not?

A. The button head?

195 Q. Yes.

A. Yes, we have made tests of the difference in holding power of the button head and taper and our mechanical engineer gives us 36,000 pounds for the button head and the taper from 27,000 to 29,000, giving the button head 4,000 to 5,000 pounds more than the taper head.

Q. Is the taper head you speak of similar to No. 3?

A. Yes, that is the bolt.

Q. On Plaintiff's Exhibit A?

A. Yes, sir.

Q. Have you ever known of an explosion on any road in an oil burning locomotive caused by the use of button heads?

A. No, sir.

Q. Does the United States government make certain requirements as to how boilers and engines shall be constructed?

A. No, sir, not as long as we have the proper factor of safety.

Q. They do have some requirements?

A. They have a factor of safety, and the factor of safety is five on the shell of the boilers; that is if we have a 200 pound pressure boiler it should stand up to a test of a 1000 pounds; five to one.

Q. Do they inspect engines and locomotives in general?

A. Yes, sir.

Q. The United States inspectors?

A. Yes.

Q. Is there standard up to which locomotives must be built in order to pass their inspection?

A. Yes, sir.

Q. Is the use of either type of crown bolt permitted?

A. Either type is accepted when properly applied.

Q. Have you examined the crown sheet and the stay bolts and button heads that came out of Engine No. 1902?

196 A. Yes, sir.

Q. In your opinion from that examination what was the cause of the explosion?

A. Low water; the absence of water on the crown sheet.

Q. What indications did you find of that condition?

A. Mr. Dowling insisted that we go in the fire box, and so the first thing to do is that we examine that fire box for any defects, blisters, or cracks, that would contribute in any manner to the accident. Then we examined that portion which has given way, and I find on that examination there were seven conditions, six of which could not exist had water been on that crown sheet. The seventh could possibly have been, but six always in evidence in cases of low water.

Q. What are those seven conditions?

A. The first is the condition of the flues. The second is the condition of the top of the flue sheet.

Q. Won't you state what the condition is as you go through?

A. The condition of the flues was bowed up in the center, showing conclusively that the upper portion of the flue had been heated sudden in going up the flue, and the bead on the top of that flue had six bowed up.

Q. That was on six?

A. It was on the top flues of the engine. The next is the sinking down of the flange on the flue sheet. This could not have happened in a perfect sheet unless it was pulled down by the sinking of this crown sheet.

Q. That is the same at the front of the crown sheet?

A. Yes.

Q. At the point marked X?

A. Right at that point. That was, we found, sunk down $\frac{5}{8}$ of an inch at the flange.

Q. What were the other indications?

A. The other indications was the bag in between the radial
197 stays which you will all notice on that crown sheet on the upper portion. The center does not show the sag due to the fact that the sheet came down and stretched and pulled them out and they were not there at the time she let go, but coming down she tore off, she bursted out through it in the area and tore it straight. The length of the holes and reduction of the sheet—the thinness of the sheet. The sheet originally was $\frac{5}{8}$. We found on examining that these holes where the sheet went down is only a quarter of an inch in thickness. This is positive evidence of low water because in a cold sheet that would not occur without a rupture. It is a reduction of that sheet of 33 1-3 per cent, and those holes being in there and that sheet would rupture. The heat softened it. It is like a piece of putty. It would have been hard to break. If it is hard you could not pull it; you break it; you do not reduce the area.

Q. Now you spoke of seven conditions, what were the other two?

A. The color line and the water line. That is the heat line and the water line. The sheet being uncovered to a certain extent it shows a water line where the absence of the water was shown at the highest point in that sheet; and the heat line would be the portion that was overheated by the indications, the flame infringing upon that sheet. The difference, I might say, in that respect is that the sheet, being uncovered by low water, it is cleared on the opposite

or inside of the box by the scale getting warm and breaking off. The heat line shows where the iron is hot, and when that portion cooled off it pulled off in front, uncovered, and the heat doesn't strike that part. It won't show the color. I might say that this is due to the draft on this engine. When she is working the flames do not go up against the front end of the crown sheet.

Q. Then the line of flame is something in the shape of a ball?

A. It strikes this back wall and goes back there.

198 Q. Have you had any experience with the use of fusible plugs on locomotives?

A. In early days while working for the Pennsylvania line we used the fusible plug, but it was requested by the engineers that it be removed, due to the fact that in a great many cases the engineer was discharged on the contention that he had low water when they both declared the water was in the boiler and it was not effective then—these fusible plugs let go—and it was taken out, and I do not believe it has been used since on the Pennsylvania lines. We do not use it on the Santa Fe at any point.

Q. Do you know of any line that does use them outside of the Southern Pacific at the present time?

A. I am not aware of the fact if there is.

Q. From what you have seen and heard of them do they tend to eliminate accidents?

A. No, sir, I recently inspected a Southern Pacific engine where there were two fusible plugs in this engine and the explosion was the most disastrous that I have ever experienced.

Q. What would you say as to this scale on this crown sheet here, would that cause any tendency towards overheat?

A. I would say, Mr. Dorety and ladies and gentlemen of the jury, that I never saw a crown sheet that was in better condition than that crown sheet when I examined it. It could not be in better condition as regards scale.

Q. Would such scale as there was on there cause it to overheat at all?

A. No, sir, that would not show; it would not change it; it possibly would be a few degrees.

Q. What would you say as regards the scale on these bolts?

A. It would have no effect whatever; that is out of the question.

199 Cross-examination:

Mr. Zettler:

Q. Are you interested in having your theory as to button heads held correct?

A. Yes, sir, by tests.

Q. The question is, are you interested in having your theory held correct?

A. No, sir, not particularly.

Q. You do not care?

A. Whether they are one or the other it is immaterial.

Q. What kind do you use?

A. We are using at the present time the taper head bolt.

Q. The kind marked No. 3?

A. Marked 3, I believe.

Q. That is the kind you are now using?

A. We use them when we apply new bolt heads; yes, sir.

Q. Is the Pennsylvania road that you had experience as to fusible plugs an oil burning road or a coal burning road?

A. The Pennsylvania was a coal burning and the Southern Pacific is an oil burning.

Q. At the time that you referred to in your testimony as to fusible plugs, was it an oil burning or a coal burning?

A. Both classes.

Q. At that time?

A. What time is that?

Q. At the time you said you had experience on the Pennsylvania road in regard to fusible plugs?

A. That was a coal burning engine, yes, sir.

Q. Do they use oil burners?

A. Yes.

Q. What association are you president of?

A. The Master Boiler Makers' Association—the International Boiler Makers' Association. No person except a man that has passed—has had charge of railroad shops or contract shops wherein boilers are constructed and repaired is eligible.

Q. You know the members of that? As president you know the membership?

A. Quite a number of them; not personally acquainted with all of them.

Q. Are the officials of the Great Northern Railroad Company members of that association?

A. No, sir.

Q. None of them?

A. What would you call an official, an employe?

Q. Is any person connected with the Great Northern?

A. Yes, sir, I believe that the boiler foreman that is employed by the Great Northern is eligible for membership. I believe there are two of these men so employed members of this association.

Q. You stated on direct examination that although you actually use the taper heads that the other kind was just as good?

A. We have tried it. We have had explosions with both kinds.

Q. You said that was just as good. Is that your testimony?

A. The button head, I found, that is superior; it carries 5000 pounds more, but the taper head holds 30,000 pounds per inch as a factor of safety, so therefore we are above the requirements of the government which is five to one. It is cheaper.

Q. And you are using the cheaper?

A. On account of economy. Any bolt, the taper head—

Q. You said, did you not, that the button head was safer?

A. I have not said so. I have said that either one is sufficient and is passed by the government.

Q. And which would you say is safer?

201 A. If I had to drive a horse——

Q. Will you kindly answer the question?

Q. If there is something I can get for \$5, and if I do the same work with something that costs \$10, I take the \$5.

Mr. Zettler: I move to strike the answer.

The Court: The answer will be stricken.

Q. What is your opinion as to which one of these heads is the better head?

A. The button head.

Q. Do you know a concern named the American Locomotive Company?

A. I believe there is a company of that name in existence.

Q. Is it rather large?

A. I believe it is. It builds a number of boilers for different railroads.

Q. Do they build them for your road?

A. Yes, sir.

Q. They have a chief mechanical engineer?

A. I believe they have. I would if I was running the business.

Q. Do you know the name of that person?

A. No, sir, I do not; I am not personally acquainted with him.

Q. If the general mechanical engineer of the American Locomotive Company is of the opinion as follows: "That on coal burning engines the central rows of radial stays——" I will give you this sheet and you can look at it.

If he is of the opinion "On coal burning engines the central rows of radial stays usually have button heads under the crown sheet but on oil burners the stays have the heads riveted over, as the button heads are liable to be injured by the intense heat of the oil flame." If that is his opinion you would say that he is mistaken?

A. I have not had this experience, and I believe that every mechanic acquainted with oil and other things—I believe
202 they are as much correct as he is.

Q. Will you answer the question?

A. I will say he is not always correct. He does not know it all. He has as much right to be in error as anybody else.

Q. Will you answer that question, if he is of the opinion that I have just stated, would you say he was correct or incorrect?

Mr. Dorety: I object to the question, he has already answered.

The Court: He may answer again. Exception.

A. State it again.

Q. If the chief mechanical engineer of the American Locomotive Company is of the opinion that I have just read to you, then you would say he was incorrect and that you were correct?

A. From my experience, yes.

Mr. Dorety: I want to object to the question on the ground that it is a hypothetical question assuming something which is not in evidence.

The Court: That objection will be over-ruled. Exception noted.

Q. Your answer is "Yes."

A. Yes, from my experience.

Redirect examination:

Q. Mr. Johnston, what conditions lead to your adopting the type of taper head crown bolt on oil burning engines—on some of your engines—where you have adopted them?

A. The opinion of our mechanical engineer that they were fully as capable of holding the load and were more economical to apply.

Q. What are your water conditions down there?

A. Our water conditions are fair. We have good water. We have good water conditions.

Q. Under bad weather conditions would that have any effect on the frequency with which bolts have to be renewed?

A. Yes, sir, it would.

203 Q. Which bolt is the cheaper to renew?

A. The taper head.

Q. The No. 3?

A. I didn't get the number, No. 3; yes, sir.

Q. Would the mechanical engineer of the boiler manufacturing company get the same practical experience, the same chances to see actual button head crown bolts in use as you would?

A. This mechanical engineer had different tests made to determine. An old fire box he had removed and it had both classes of bolts in it and he tested both and drew his conclusion.

Q. That is the assumption?

A. Yes, sir.

Q. Do you know what the rating is?

A. Yes.

Q. I am asking about the engineer of this American Locomotive Company.

A. He would not have that experience; he is connected with the building.

Q. Is it or is it not a fact that if he wanted to find out which would be the best he would have to go to men like yourself?

A. Yes, and take an old box that had been in service and find out.

Q. Do you know, as a matter of fact, what the opinion of the engineer of the American Locomotive Works is on the subject.

A. I never heard that before.

Mr. Zettler: Would the court admonish the witness not to answer the question until we have had an opportunity to object and the court passed upon it.

A. I never heard his opinion before; no, sir.

Q. From all you know you don't know whether you have a different opinion from him?

A. No, sir.

Recross-examination:

Q. Now, I want a Yes or No answer on this if you can give it. Do you on your road or do you not in oil burning engines
204 use the sort of button heads shown as 1 or 3? That is do you use the one shown as No. 3?

A. That is considered the bolt of my line.

Q. It is the taper?

A. We use the taper the same as No. 3, similar to No. 3.

Redirect examination:

Q. Have you any of the button head bolt in use on your road?

A. Yes, I said we have them in ten years and will not remove them until the fire box is removed.

(Witness excused.)

WILLIAM E. MURRAY, a witness called by the defendant, sworn, and testified:

Direct examination.

Mr. Dorety:

Q. Where do you live, Mr. Murray?

A. 509 9th Ave., Seattle.

Q. What is your business?

A. Boiler inspector for the City of Seattle.

Q. What experience have you had in boiler works?

A. I served my time in the Dixon Locomotive Works at Scranton, Pennsylvania, as boiler maker. Later on I was employed in the capacity of fireman and later promoted to the position of locomotive engineer. Since that time I have been employed by the United States Government for five years in the capacity of engineer; and for the past four years I have been inspector for the city of Seattle.

Q. Have you made an examination at my request of this crown sheet out of engine No. 1902 which is before the jury here?

A. Yes.

Q. And the stay bolts from the same engine?

205 A. Yes.

Q. From your examination are you able to express an opinion as to whether or not the sheet was hot or as to whether or not it had water upon it at the time of the explosion?

A. In my opinion it was a case of no water.

Q. What is your opinion as to the temperature of the sheet at the time it went down?

A. The temperature of the sheet probably was in the neighborhood of twelve or thirteen hundred degrees.

Q. Twelve or thirteen hundred degrees Fahrenheit?

A. Yes.

Q. Would that be red hot?

A. It would be a dull red. It might be what you call a red hot—not cherry red.

Q. Would it be possible for a sheet to attain that temperature with water on it?

A. No, sir.

Q. Have you examined that scale there is on the portion of the sheet?

A. Yes, sir.

Q. Would it be possible—would that scale make any considerable difference in the temperature of the sheet?

A. Not any appreciable difference.

Q. What would be the temperature of the sheet, approximately, with water on it with pressure at 200 pounds per square inch?

A. Approximately the temperature of the steam.

Q. Which would be what?

A. 384 degrees, I think they were giving here as the temperature at 200 pounds.

Q. Assuming a temperature of about 380 to 388 degrees how much difference in temperature would you say it was on the upper and lower part of the sheet?

206 A. Practically none at all.

Q. What would you say as to the probability of the lower side of the sheet of that thickness being nine hundred to one thousand degrees while the upper side were three hundred and eighty?

A. I would consider it to be absolutely impossible.

Q. Would you say that with any portion of the sheet up to 900 degrees on the fire box side that a fusible plug would stay in it?

A. The fusible plug will melt at 447 degrees.

Q. Would it be possible to raise the fire box side of the sheet up to 500 degrees without melting the plug if it worked at all.

A. No, I don't think it would.

Q. What are the indications there, do you remember, that this sheet was red hot at the time it exploded?

A. The main indications and conditions on the big piece is on the rippling between the radial stays.

Q. What would you say was the water line at the time of the explosion on that sheet?

A. At any point below the surface of the edge, and that I could not say as to how far it was below it.

Q. How can you account, if at all, for the front corners of the sheet not being bagged?

A. Well, you get the same conditions on all four sides. For instance, it is supported by four walls. You have your two inside sheets and back sheet. The arch bottom was below the sheet, the weakest point being the center of the sheet.

Q. The edges of the sheet—each edge of the sheet is supported by a vertical sheet?

A. By a vertical sheet, and the half on the top makes a reinforcement.

Q. And that support has a tendency to assist the bolts near
207 the corners in holding?

A. In carrying the load.

Q. What can you say as to the amount of heat to which the front edge of the sheet is exposed as compared to the middle?

A. On the crown sheet the front portion of the sheet would be practically clear of contact from the flame, for the reason that the suction of the flues would be a sinking force, causing a short-circuiting, as it may be termed, leaving the bagged part of the sheet in there absolutely free to the open sweep of the flame.

Cross-examination.

Mr. Zettler:

Q. In your direct examination when you said that the explosion was caused by low water, you do not base that statement on actual knowledge, the cause of the explosion, by the way, but on your opinion, is that a fact?

A. That is from the examination made of the sheet?

Q. It is not from what you know whether there was water—of what you actually know whether there was water on that sheet?

A. No, sir.

(Witness excused.)

H. D. HINCKLEY, called as a witness by the defendant, sworn and testified:

Direct examination.

Mr. Dorety:

Q. What is your business?

A. Superintendent of motive power of the Oregon Short Line.

Q. What are your duties in that capacity?

A. Supervising the mechanical department in rebuilding and building locomotives.

Q. The mechanical department includes locomotives, the
208 building and operating of them?

A. Yes.

Q. What railroad experience have you had?

A. Well, I have had a varied railroad experience. I came out from the shop, was a mechanic; I fired a locomotive, run a locomotive; appointed a round house foreman, a general foreman, assistant master mechanic, master mechanic, general master mechanic, and superintendent of motive power.

Q. What roads have you been with other than the Short Line?

A. Been with the Southern Pacific, the Denver & Rio Grande, Cincinnati, Hammond & Dayton, Southern Pacific and Grand Island.

Q. What experience have you had with button head crown bolts on oil-burning locomotives?

A. Have had considerable experience, five years.

Q. Have you any such crown bolts on your road now in the oil service?

A. Yes.

Q. How long have they been in use, the longest?

A. I think six years in oil. We only have a few oil burners on the Oregon Short Line. Most of our engines are coal-burning engines. We have a few on the Yellowstone branch.

Q. Have you had experience with them on the Southern Pacific?

A. Yes, sir.

Q. With oil?

A. Yes.

Q. Have you been familiar with the use of them in general on roads that have used them?

A. Yes, both in coal and oil.

Q. Have you also had experience with the other type of bolt which is indicated as No. 3 on Plaintiff's Exhibit A, the riveted bolt?

A. Not of that particular type; no, sir.

209 Q. What type have you seen?

A. The type of bolt we have nearest is especially constructed. Do you mean the No. 3 bolt?

Q. Yes.

A. Well, the nearest type we have to that has a considerably larger head and tapering.

Q. By that you mean that at the bottom of the crown sheet it is larger than at the other end?

A. Yes.

Q. About how much larger head is it?

A. I don't know the dimensions of that head. I don't think it gives it. I don't think there is anything on this head that gives the dimensions. There is no dimensions on the head of the bolt.

Q. Have you ever seen a bolt just this type, like No. 3?

A. I cannot say that I have.

Q. Has the Southern Pacific any bolts just like that?

A. Not to my knowledge.

Q. How long ago did you leave the Southern Pacific?

A. I left the Southern Pacific the 1st day of May.

Q. Would you compare the bolt that you have referred to as being nearest like No. 3 as being as safe as this No. 3 type?

A. It is as safe a bolt. It won't carry the load but it is as safe a bolt.

Q. I am asking you to compare the type of bolt that you use with this No. 3 bolt, indicated on this paper.

A. That taper bolt we use is the safer bolt.

Q. Than this No. 3?

A. Yes, sir.

Q. How does the taper bolt that you use compare, how has it compared in your experience with the button head crown bolt?

A. We put the taper bolt in for economical purposes. It
210 has the safety—it has the factor of safety and it is permissible, and we had them changed, changed them in the fire box.

Q. Has the button head bolt given as good service as the other?

A. I never heard any complaint from the button head bolt.

Q. Have you ever had any give way on your line with water on it?

A. Not to my knowledge.

Q. Have you ever had a crown sheet failure caused by the use of button head bolts?

A. I would not attribute it to the bolt. I never attributed it to the button head bolts.

Q. Have you had failures with the other type of bolt?

A. No, sir. Only recently, I may say, that we commenced to use these taper bolts.

Q. Have you known of explosions on other lines with the taper bolts?

A. I have known of boiler explosions; yes, sir; with boilers equipped with the other bolts.

Q. In your opinion would sufficient heat be generated in an oil-burning engine to burn off or melt off a button head or cause it to drop off with water in the locomotive?

A. I have seen some very severe tests with oil-burning engines equipped with the button head bolts but I have never seen a failure where there was water on the crown sheet.

Q. Have you ever heard of one?

A. No, sir.

Q. What was this severe test you speak of?

A. The most severe test that I have seen made on an oil-burning engine was made by a Federal inspector, a government inspector, forcing the draft to such an extent that the pipes would not relieve the working pressure of the engine?

Q. The pipes of the steam escape?

A. Yes, he forced it to such an extent that the pipes would
211 not relieve the pressure.

Q. Well, what happened?

A. Well, one thing that happened we were requested to put more pipes on.

Q. So that they could relieve it?

A. Under such a severe test.

Q. How high did the pressure come up?

A. The pressure went up between fifteen and seventeen greater than the working pressure of the engine.

Q. Would the fire under those conditions be hotter than any ordinary draft?

A. Well, I should judge it would be considerably so in order to force the engine beyond that point.

Q. Was there any injurious effect on the button heads?

A. None whatever.

Q. Have you examined the crown sheet of engine No. 1902?

A I looked at the crown sheet of engine No. 1902 last Sunday afternoon.

Q. And you have examined some of these stay bolts?

A. Yes, I saw some of the stay bolts there at the same time.

Q. Can you form an opinion of the temperature of the crown sheet at the time of the explosion from the condition of the sheet now?

A. I don't know that I would care to say the exact temperature of the crown sheet at the time but it was greater than the stress of the metal would stand to be heated but as to the degree of temperature I would not care to state that.

Q. Would you say whether or not it was red hot?

A. It is my opinion that the crown sheet must have been overheated to such an extent that it was less than possibly a dull red, but it must have been red. That would be my opinion.

Q. In your opinion would it have been possible to produce the effect which you have seen on this crown sheet if there were water on it?

212 A. Not from my experience; no, sir.

Q. Do you use fusible plugs on your line?

A. No, sir.

Q. Do you know of any railroad outside of the Southern Pacific that does use them?

A. Not at this time. No, I cannot say that I do.

Q. So you know while you were on the Southern Pacific did they find the fusible plug satisfactory?

A. During my stay on the Southern Pacific the fusible plug had not been generally satisfactory as being perfect. They were more or less under the experimental stage. They changed them once or twice and also changed the location in the sheet.

Q. Experimenting trying to find something that would work.

A. That would be my opinion, about what I know in regard to instructions received in regard to applying them.

Q. Are they still having explosions in engines with fusible plugs on them, or have you known of any recently?

A. Yes, sir.

Q. How many plugs did the engine you refer to have?

A. The last engine that I know of that engine had two fusible plugs on the crown sheet.

Q. Was the accident due to low water?

A. Yes, it was due to low water.

Q. That was when?

A. I cannot recall just the date, but it was less than seven months ago.

Q. Some time this year?

A. Either the latter part of last year or the early part of this year.

Q. I think you said you didn't know of any oil-burning road outside the Southern Pacific that uses them?

213 A. I do not.

Q. From your experience with them do they show any

tendency to open up and let the water out when there is water in the boiler?

A. I have known fusible plugs to fail with water in the boiler.

Q. And you have known them not to work?

A. I have known them not to work when it is the opinion that water was off the crown sheet and away from the plug.

Q. In your opinion do they tend to reduce the number of accidents?

A. From my experience I would say no, that they have not been satisfactory in regard to serving the purpose for which they were intended.

Cross-examination.

Mr. McCabe:

Q. The heads that are used on the crown bolts of the Southern Pacific are like this one (ind.) No. 3, the one I mean?

A. I have seen No. 1 used on the Southern Pacific.

Q. Have you ever seen a head like No. 3 used on crown bolts?

A. We never apply them.

Q. What kind of a head have they?

A. Something similar to No. 3. I cannot see the dimensions; they are not on the head.

Q. Please come down and mark with a pencil on No. 1 just the kind of a head.

A. I could not do that, Mr. McCabe, I would be pleased to do so if there were any dimensions on there. I do not want to mark something that would be entirely wrong. If there were dimensions on this head I might give you some idea in regard to it but not looking at the dimensions I do not see how it would be possible for me to do that with any degree of accuracy.

Q. Would you say that the heads of the Southern Pacific
214 are larger or smaller than the bolt No. 3?

A. My idea would be that the heads are larger. I would not care to say anything that I wouldn't know something about. My intention is to give it as near correct as possible, but in the absence of dimensions—

Q. You were employed on the San Joaquin Division?

A. No, sir.

Q. Do you know how much longer the sheets of a fire box in the same engine, same class of service, on the Southern Pacific last with coal than they do with oil?

A. I believe there are some that have not been changed yet which have been changed from coal to oil burners and the same bolts are in there, and the length of service they gave prior to being changed I am not able to state.

Q. Is this true that the coal burning engine, say of the 2700 class of the Southern Pacific—you are familiar with that class of freight engine?

A. No, I have to plead ignorance.

Q. Are you familiar with the 2800?

A. I must plead ignorance.

Q. Are you familiar with the 3000?

A. I don't want to be misunderstood; there are several classes of the 3000 class that I know of.

Q. Are you familiar with the 3,000?

A. Some of the 3000.

Q. There is only one 3000 class on the Southern Pacific?

A. I differ with you.

Q. Then I will be more explicit: The 3000 class of the Southern Pacific that have cylinders 22 x 28 inches in diameter, and an 84" wheel engine truck, and 4-wheel truck, and 2 pair of drivers and a trailer, are you familiar with that type of 3000 engine?

A. Well, I have to say that there are two classes of thirty 215 hundred of the same dimensions; two thirty hundred types of boilers.

Q. Have you in mind any particular number of engine on the Southern Pacific of the same class within one hundred, the ten, eleven, or twenty-two hundred?

A. I will be glad to answer any question in regard to any engine that I am familiar with if you will ask me.

Q. Do you remember the twenty-two hundred engine, perhaps the foremost engine on the Pacific Coast?

A. I remember two different classes of twenty-two hundred engines. If there are more than that I cannot remember.

Q. This particular class I have reference to was built by the Cook Locomotive Works?

A. Well, I will say that I am familiar with two types of twenty-two hundred engines.

Q. Are you familiar with type No. 2208?

A. No, I cannot say that I am.

Q. Are you familiar with type No. 2259?

A. No.

Q. What type are you familiar with?

A. 2278, 2222, 2220.

Q. We will take 2220. When the 2220 was in coal one No. 9 injector would supply the boiler when the engine was working at a maximum, the boiler being built to maintain 160 pound steam pressure?

A. I could not say.

Q. Do you know?

A. I do not know. I was not on the engine. I could not tell you as to that.

Q. Would you be surprised if I would tell you that same engine has three injectors on it?

A. 2220?

216 Q. Yes.

A. Yes, I would be very much surprised if you told me that for I have had jurisdiction over that particular engine several years and I never knew she had three injectors before.

Q. And that all these three injectors are worked at one time?

By working at one time I mean supplying water to the boiler of the same pressure maintained with oil fuel?

A. I cannot reconcile that, for I never saw them on the engine and it has been under my jurisdiction three or four years.

Q. Don't you know, as a matter of fact, that in that class of engine on the Southern Pacific that the fire box sheets don't last over two or three years in oil when in coal they last ten to twelve years?

A. I know that is not so.

Q. How do you know it?

A. Personal knowledge.

Q. When did you people apply a fire box, how long ago, in that class of engine, 2220?

A. In 1910.

Q. And after 1910?

A. They are in the engine yet.

Q. Where is the engine?

A. Running out of Oakland, or was on the 1st day of May.

Q. Where to?

A. Several points out of Oakland. From North Oakland to Fresno; Oakland to San Joaquin; Oakland to Sacramento and San Francisco by the way of — cut-off running to Red Bluff.

Q. Assuming this to be the highest point of the crown sheet—You have heard the testimony that it took eight or nine minutes from the time the water left this point (ind.) until this back portion was bare? You heard that?

A. No, I did not.

217 Q. What did you hear?

A. I heard it got bare, if my memory is correct, in from three to five minutes.

Q. Your memory is defective, as I recall.

Q. We might differ.

Q. What explanation have you got to offer in reference to the color of the crown sheet having a blue color when it is burned and having its natural color now when it has not been used in any manner since the time it came down?

A. Atmospheric conditions change it.

Q. You would not want to say, would you, that the rivets in the heads on the crown sheet show any signs of overheat?

A. What?

Q. You would not want to say that these rivets or heads here show any signs of overheat?

A. I have not said that.

Q. You would not say that either?

A. I don't know whether I would nor not until I made an examination at the time of the explosion. I would have to withhold any such testimony unless I could have been here to make an examination at the time.

Q. I ask you to make an examination now.

A. But I said atmospheric conditions change it, the discoloration on the sheet and rivets.

Q. 3,000 to 3,500 degrees of heat applied to a sheet of that thickness, in how many minutes will its color forever change?

A. You would have to go to the authorities to get that correct. I do not know that I would be in a position to give it reliably, where I would like to testify, where you have authorities on that.

Q. How do you account for the fact that none of the holes or rivets show any signs of overheat or stretching upon the entire front row of the crown sheet?

A. I think that can be accounted for easily.

Q. Proceed.

A. You may not accept it as an explanation but I will express my opinion as to that.

Q. Tell the jury.

A. I will be glad to tell the jury.

Q. Answer the question, please.

A. I am going to. The draft arrangement of the engine which are arranged in the front end, the greater portion of this vent has a tendency in regards to the flame striking the different parts of the sheet under different working conditions. It would be most impossible to drive an engine wherein the working conditions are so severe that the draft of a flame would be equal over all parts of the sheet, and there are portions of the sheet that are less heated than where the draft concentrates and strikes; and the sides whereof Mr. McCabe speaks, holds it there also in the front. It is quite an additional support. Besides it has an upright sheet and the front has the big flue sheet flanged and riveted to this crown sheet at the particular time of this accident, and the rate of speed under which this engine was working as to pitching I am unable to say, but I am willing to give in my evidence that the draft conditions go under the explanation I have tried to make to you.

Q. Is it not true that the longer the gases remain in the fire box and above, that the hotter it gets in that portion?

A. If gases are allowed to remain in the fire box, or that part of the fire box where the flame concentrates or leads out, I should judge it would be hotter there than at any other place in the fire box.

Q. And the gases that travels around this manner (ind.), out through there?

219 A. I can tell you as to that. There might be conditions under which the engine was laboring and the rate of speed under which the engine was running. It might strike different portions of the fire box, especially on the portion whereon this crown sheet was heated.

Q. Ordinarily is my statement true?

A. I will not say as to that.

Q. Assuming that the engine was working at maximum capacity, 6 miles an hour, evaporating 4,000 gallons of water—That is what I mean by maximum—she was working live steam the full length of the stroke?

A. What is the question?

Q. I am asking if the statement I made in reference to gas travel-

ing the longest distance of the fire box, where the engine is working by a maximum amount of live steam, following the piston's, if gas wouldn't travel all through here in this manner and this would be the hottest point? (ind.)

A. No, I don't agree with you, if the engine is drafted enough with all drafts under normal conditions.

Q. Isn't this true, that the gas comes from the entrance, and the gas is drawn right around up next the top of the flues, and turns there, in the absence of having sufficient draft through there?

A. I have seen engines taken in the round house due to improper drafting or the working conditions of the engine under certain circumstances, on account of the flues filling up by corroding.

Q. We are filling them up?

A. You say so.

Q. We will assume that these particular flues were cleaned out? We will assume that the Great Northern Railway Company keeps its flues clean?

A. I am not saying they were stopped up.

220 Q. If the flues were all stopped up across the gas wouldn't pass through?

A. No, I think if they stopped up different drafts it would not draw through there.

Q. A fire from back here (ind.) isn't this sheet hottest then?

A. Not under certain conditions.

Q. Isn't it true that as soon as the gas or flame enters the flue, just that very moment it falls below the ignition temperature?

A. Oh, no.

Q. And the gas from this portion of the fire box down here perhaps never ignites at all?

A. No, I don't think that is so.

Q. For the reason that there is not sufficient oxygen?

A. Our draft on our engine is so that the flame is clear where they are driven at normal conditions. Now, I will say again that they change under working conditions.

Q. Normal conditions we are assuming are working conditions?

A. All conditions are not normal. Sometimes it depends upon the contour or topography of the country that the engine goes through that makes those conditions.

Q. Now, I will say for your benefit that there is no doubt in my mind that the flues were properly cleaned out and good and clean—

A. I don't think that the gas ever reached the top flues. I will take your own explanation of the engine work, I will take your planation of that, and the engine laboring, you say, where the steam followed the piston to the maximum at full stroke of the same wherein it would be impossible to go over six miles an hour, and so I will say in my experience that part of the crown sheet was at a lesser degree of heat by considerable than farther back.

221 Q. What do you mean by considerable?

A. I mean as I said, that I am willing to take Mr. McCabe's explanation. I cannot figure that out for you. I say I cannot do that on evidence with any degree of accuracy.

Q. Then it is your opinion that this portion of the sheet was the hottest, the front and top of blue sheet?

A. It depends on the conditions. You have assumed conditions.

Q. Now, I will ask you if this is the portion that you say is hottest? (ind.)

Q. I should judge that along about in there that the flame was the hottest by some indications at that time.

(By Mr. Dorety:)

Q. About the center of the crown sheet?

A. Yes.

Q. You are still in the employment of the Short Line?

A. Yes, sir.

Q. Do you wish to continue in that employment?

A. Not to such an extent that I would in any manner give wrong testimony, no, sir.

Q. You came over for the sole purpose of testifying in this case?

A. Yes.

Q. What compensation are you to receive?

A. I am receiving no compensation from the Great Northern, sir.

Q. Who else beside Mr. Dorety did you go over this testimony with?

A. I don't know that I have gone over the testimony with Mr. Dorety. I have not admitted it.

Q. You were informed that there was an ex-engineer and a lawyer going to try this case and you wanted to be pretty well primed, is that true?

A. That is not true.

222 Redirect examination:

Q. No one ever accused Mr. McCabe of being an engineer or a lawyer either?

Mr. Zettler: I object to that kind of a question.

The Court: I will sustain the objection.

Q. If the crown sheet, if the water line ran along in a parabola something like indicated on this sheet of thin paper, would the side sheets or side seams of the crown sheet at all times be protected by water although the center of the crown sheet was exposed?

A. They should be protected.

Q. If it were built according to the evidence that they were built, according to the evidence here?

A. According to the evidence given here it should be.

Q. If these rivets on the crown sheet had been heated at the time of the explosion so that they were blue, as it has been testified, a big portion of the crown sheet was colored, would you expect that to appear now as to a big portion of the crown sheet, or would you not?

A. My experience is that atmospheric conditions change the color of the metal.

Q. In what way?

A. I don't know what affects it, but whatever it is it brings about a change.

Q. What is it that disappears?

A. The color of the metals, that is the blueness.

Q. You were asked some question based on the assumption that there was heat from 3,000 to 3,500 degrees, or thereabouts, in the fire box, is it your opinion that that is the heat of an oil-burning locomotive?

A. I said I was willing to accept the authorities; that I would not care to express an opinion or state any authority on that.

223 Q. Do you know what the best authorities say in regard to that?

A. No, I cannot say. I could not give you that off-hand.

Q. Now, Mr. McCabe was asking you about the relative strength of the draft in a particular row of the flue sheets and the lower rows, isn't there also a varying there on any engine you get by reason of the lower slung in the front end?

A. The draft pipe, the left pipe, it is clear.

Q. The varying that you can see practically?

A. You can get an upper draft or under draft, or you can protect it so it is very near central. I have found that a good many drafts, the greater number of flues in a boiler, that it has never been demonstrated to my knowledge wherein you could cover all the flues in a boiler with a cold draft, and you can centralize the draft wherein it will cover the greatest number. That has been my experience.

Recross:

Q. Would you be surprised to see a test that was made by the United States government of this identical crown sheet and they say that it shows absolutely no signs of heat and no low water mark at all?

A. I would.

(Witness excused.)

(Adjournment taken until 9:30 to-morrow morning.)

224

June 16, 1914—Morning Session.

JAMES T. JOHNSTON, recalled for further direct examination.

Mr. Dorety:

Q. There is one more question I intended to ask you and that is: Are you familiar with any tests which have been made to determine the temperature in the fire box of an oil-burning locomotive?

A. There was a test made at Coakhill, Pennsylvania, conducted by Professor Goss and E. B. McFarland, engineer of the A. T. & S. F.

Q. That is your road?

A. Yes, sir.

Q. What did that demonstrate?

A. If I recall correctly, that was a temperature in the fire box

of from twenty-two to twenty-seven hundred degrees. I am not positive of the figures.

Q. That is on an oil-burning locomotive?

A. Both tests were conducted on oil-burning apparatus.

Cross-examination.

Mr. McCabe:

Q. What is the ignition point of hydrogen gas?

A. I could not say.

Q. What per cent. of fuel oil is used on your road, the Santa Fe, as containing hydrogen gas?

A. I have not got the figures on that.

Q. Approximately?

A. The approximate figures with oil, for three barrels of oil——

Q. I am not asking about three barrels—I am asking what per cent of hydrogen gas is in the oil?

A. I could not tell you.

Q. And you don't know the igniting temperature of hydrogen gas?

A. No, sir, I could not tell you.

225 Mr. Dorety: Before we proceed further I want to make a motion that the court permit the jury to inspect a test on an oil-burning locomotive to determine the effect of the oil fire as to whether it will heat the button heads red hot or not. It is a test I would like to make before the jury and I cannot very well bring the locomotive here. It seems to me that is practically the only question in dispute between the parties, one side claiming that they will get red hot and the other that they won't, and that it would be understood and enlighten the jury to go and see.

I would like also to ask that they be permitted to examine the crown sheets of any locomotives that may be available in the shops or yards to determine the question whether the sheets are all even as shown by our proof or sagged as contended by plaintiff.

I make the motion at this time so if the court will grant it we can get a locomotive and make the test later on.

Mr. Zettler: I think that would prolong this case unduly.

The Court: As far as the taking of the time for the test is concerned, I think that can be arranged for some hour after adjournment.

Mr. Zettler: The trouble with that proposition is that this is going to be made under conditions that we know nothing about, in which the defendant will have the stage or setting.

Mr. Dorety: I would be glad to have Mr. McCabe operate the theater.

Mr. Zettler: Everything will be staged and it is an entirely collateral matter. If we had been told in advance so that we could have some part in setting the stage and see that many of the things that must be seen differently should be seen properly, as to the kind

of locomotive, its past use and all those things, it would be fair; but the court can see on this collateral matter, they having experts, they are going to have the benefit of all their testimony without this stage.

Mr. Dorety: If the court would permit a trip as far as Gold Bar we would be glad to have them see any locomotive, have the test made on any locomotive, let them pick the locomotive. Let Mr. McCabe stage it. It is just simply a question of whether a fire will make a bolt red hot with water on it.

Mr. McCabe: The proposition, if your Honor please, is capable of being told to a jury. It is clearly unfair to us. We can take any oil burner and she can stand there an indefinite time evaporating five or six thousand gallons of water per hour and yet show no signs, that this jury can see, of overheat. Those are not the conditions that actually occurred. We have the crown sheet here of the engine that was in the explosion.

Mr. Dorety: They could show whether the bolts get red hot.
* * *

The Court: I think I will deny this motion. It is a matter, it seems to me, that can be so well covered by testimony, that you seek to show whether the button head will become red hot when there is water upon the crown sheet that it would be an unnecessary effort to use up time to demonstrate it.

Mr. Dorety: The only question which has been suggested that every witness is trying to hold his job and if the jury has any doubt we would like to show them.

The Court: I will assume that the jury will decide the case not upon the disposition of people to hold jobs but the credence that the evidence is entitled to.

Exception noted.

227 JOHN BRENNAN, recalled for further direct examination.

Mr. Dorety:

Q. Mr. Brennan, were you in charge of the boiler shops of the Great Northern at Delta during the month of May, 1913?

A. Yes.

Q. Will you state whether or not any work was done on the crown sheet of engine No. 1902 during that month?

A. No, sir, there was not.

Q. Was there approximately about that time?

A. Nothing only washing it out and putting in a new flue sheet.

Q. When was the last time that the crown sheet of engine No. 1902 was scraped?

A. The last time it was scraped?

Q. Yes.

A. May 24, 1913.

Q. When that work was done on it it was scraped?

A. Yes, sir.

Q. When you said no work was done on it, you meant no repairs?

A. Not on the crown sheet; no, sir.

Q. Now, will you tell the jury just how that scraping was done, how the man got at it and what he did?

Mr. Zettler: Do you know of your own knowledge, did you see it?

A. Yes, sir. I look over all the jobs they do.

Q. You are personally present each time each man scrapes each engine?

A. Yes, sir, and look over the jobs after they do them.

Q. And during the time he is working?

A. I am not there all the time he is working. I look the jobs over after he is done.

(By Mr. Dorety:)

Q. Will you state how he got at the sheet and what he did?

228 A. We use a rod and run her in around the crown bolts, around the stay bolts.

Q. From which end of the fire box did he go in?

A. From the inside of the boiler when the flue sheet is out. You can get in whether the flue sheets are out or not by going around the flue sheets.

Q. That is he would get out from this round portion of the boiler in front of the fire box?

A. Yes, sir.

Q. And right back along the crown sheet in this direction? (ind.)

A. Yes, sir.

Q. And what sort of a tool did he use for that?

A. Just a rod planed over on the end to scrape the sheet.

Q. Does he have any light to work with in there to determine whether it is clean or not?

A. Yes, sir, we take an extension down and put it on a wire rope so you can see.

Q. Had an extension with an electric light on the cord?

A. Yes.

Q. Mr. Brennan, when that work is done do you make a report or statement of it under oath or affidavit for the United States government?

A. Yes, sir.

Q. Calling your attention to the paper marked Defendant's Exhibit 11 for identification, I will ask you if that is the affidavit you made out on that occasion and reported to the government that you did that work?

A. Yes, sir.

Mr. Dorety: I offer Defendant's Exhibit 11 in evidence.

(By Mr. Zettler:)

Q. Is that the one you sent to the government?

A. That is the report I sent in. I have a report of the same that we keep in our office.

229 Q. You make out one to send to the government?

A. Yes.

Q. You have that back from the government, have you? They send it back?

A. They keep a copy.

(By Mr. Dorety:)

Q. Is this filled in at the same time you made the others?

A. Sure.

Q. Made as a report of the work when it is done?

A. Yes, sir.

Mr. Dorety: I renew my offer.

(By Mr. Zettler:)

Q. Did you swear to this?

A. Yes, I can swear to all of it; I know it.

Q. Did you swear to this on the 24th day of May, 1913? I am asking you if you swore to this statement on the 24th day of May, 1913.

A. I did.

Q. Before whom?

A. The superintendent of shops and that gentleman in the work room. I don't know his name—I think it is Ross.

Q. Are they Notary Publics?

A. Yes, sir.

Q. This is a true copy of the one you sent in?

A. Yes, sir.

Q. There is nothing in the other copy that you sent in that is not on here?

A. No, sir. It is all the boiler work I have done.

Q. I am asking you if there is anything on the original you sent in that is not on here?

A. I don't know outside of the boiler work. I won't go outside of the boiler work.

Q. You don't know whether there is anything on the original that is not on here, you don't know?

A. There is not on the boiler work.

Q. I am asking you on this affidavit, on this paper?

A. I don't think there is; there cannot be.

Q. I am asking you whether there is or not?

A. No.

Q. You are positive?

A. I am positive of the boiler work.

Q. I am asking you about this affidavit, is there on the original that you sent in?

A. Not what I sent in. I signed for the boiler work. There is another man signs for other parts.

Q. The one you have here, is there anything on the original that you sent in that is not on here?

A. No.

Q. You are absolutely sure of that?

A. No.

Q. You are as sure of that as all other testimony?

A. Yes.

Q. That there is nothing on here?

A. There is nothing on here.

Q. Now let me ask you, you swore to this and the Notary signed it?

A. I swore to the boiler work.

Q. And the Notary signed it?

A. Yes.

Q. You made the affidavit before the Notary?

A. It is in the other.

Q. Then there is something on the original that is not on here?

A. Yes.

Q. You swore and took an oath to what you said?

A. Yes.

Q. You admit under oath that there is something on the original that is not on here?

A. Yes.

Mr. Dorety: I renew the offer.

Mr. Zettler: No objection.

The Court: It may be received.

(By Mr. Dorety:)

Q. Mr. Brennan, have you done a considerable amount of that kind of work, overseeing that kind of work, scraping and cleaning crown sheets?

A. Yes.

Q. For how many years?

A. I have been thirty-five years at the business.

Q. How many years have you given in a district where they use this Cascade mountain water?

A. Eleven years last May.

Q. What is your experience as to whether you find scale on the crown sheet or bolts deposited by this water?

A. We find very little, very little scale.

Q. Have you ever known of a bolt *krating* the head, the edge of the hole in the sheet on account of scale forming from this water?

A. No, sir, not on this water here.

Q. Was this bolt which I now hand you removed from one of your engines? (Handing witness bolt.)

A. Yes, sir. Which I could not say, what engine it was removed from. It is one of our bolts.

Q. Did you remove a bolt and tag it? Can you tell from the tag?

A. Yes, sir. I removed that bolt. (Bolt handed witness.)

Q. From what engine?

A. 1901.

Q. How long had it been in service?

A. It had been in service since the engine came here.

Q. How long?

A. Six or seven years. I have no idea when they came out
232 of the factory.

Q. Is that a fair example of the bolts in use on our engines after they have been in service?

A. Yes, sir.

Q. Will you step down to the crown sheet with that bolt and place it in the crown sheet in which it is in service so the jury can see? Stick it through one of the holes?

A. This bolt will go anywhere in the first four rows, a stay bolt. (Demonstrating.) The bolt goes in in that position.

Q. The bolt goes in in that position and be fastened on the engine above?

A. Yes.

Q. Could that bolt have been used when the sheet was in operation?

A. Yes.

Q. And the amount of looseness will indicate the amount which the holes have been stretched?

A. Yes, sir.

Q. In your opinion could that stretching take place in a sheet which had water on it?

A. No, sir.

Cross-examination.

Mr. McCabe:

Q. Yesterday, Mr. Brennan, on your direct examination you testified that you inspected the sheet the day that the engine arrived in Delta or the day after?

A. I testified that I examined it at Skykomish on the morning of the 7th.

Q. And the morning that you examined it at Skykomish was the sheet the same color as it is now?

A. No, it was not; it was blue then.

Q. There was not any of the rivets that rivets the crown sheet to the front flue sheet broke or burned?

233 A. No, sir, but the front flue sheet had given way.

Q. Were any of the rivets in this sheet along here (ind.) broke or burned?

A. They were blue on the outside that burned.

Q. I asked you if any of them were broke or burned?

A. They were counter-sunk.

Q. Were any of the rivets along in this row broke or burned? (Ind.)

A. No, sir, they were sling stays.

Q. What kind of a head did they use on the first and second rows?

A. The first, second, third and fourth were button heads without any threads on them.

Q. And in the third row?

A. That is button head.

Q. In the second row, Mr. Brennan, there were three bolts off,

to the left of the center; but one bolt off to the right of the center, is that correct?

A. I don't know; I am not sure of that.

Q. But in the fourth row there were four bolts off to the left of the center and three bolts off to the right from the center, is that correct?

A. It may be correct.

Q. All right. There were 200?

A. There were 200.

Q. And those heads were pulled off, broken off?

A. Yes, sir.

Q. There was not any instance where the sheet pulled over the head?

A. Couldn't notice any.

Q. This is the highest point of the crown sheet? (Ind.)

A. Yes, sir.

Q. How many inches higher when the engine is on the level?

A. 3 or 3 1/4.

234 Q. Now, during the month of May, 1913, you was then employed as boiler maker at the Delta shop?

A. Yes, sir.

Q. And you inspected the installation of a flue sheet in engine No. 1902?

A. Yes.

Q. In this statement which you swore to and sent to the government this is one of the questions: "Condition of front flue sheet braces?" And the answer is "Good." If there were ten or twelve out of nineteen braces broken would you have stated that they were good?

A. There were three braces broken.

Q. If there were nineteen braces altogether and nine or ten were broken and were not riveted, would you say that was a good inspection?

A. No, sir, I would not. They were not broken after she went out.

Q. How many new bolts were renewed at that time?

A. 442 repaired and replaced.

Q. They were not new bolts? They were just replaced?

A. Yes.

Q. In that examination of the crown bolts over this area that has come down, how many bolts were in there according to the report that you made that show absolutely no signs of overheat?

A. I didn't see any that didn't show it.

Q. Did you make such a report?

A. I made report of 200 head-

Q. 200 heads what?

A. Pulled off from overheat.

Q. The heads?

A. Yes.

Q. Were you personally present when this crown sheet was removed from the engine?

235 A. I was.

Q. What did you do with the scale, 50 square inches, that you took off that crown sheet?

A. I didn't see it.

Q. I asked you what you did with it.

A. I didn't do anything with it.

Q. What was done with it?

A. I don't know.

Q. You know that was taken away?

A. I don't know who took it away, there was not any on the crown sheet.

Redirect:

Q. You say there was not a piece of scale 50 inches square on the crown sheet?

A. No, sir, I didn't see any on the crown sheet.

Q. Was there any on the crown sheet?

A. No, sir.

Q. Did you hear or see of any?

A. I don't know anything about any scale on the crown sheet.

Recross:

Mr. Zettler: Will the court allow me to ask a question?

The Court: I will permit it.

Q. You are testifying under oath here that you were present when this crown sheet was taken out of engine 1902?

A. Yes sir.

Q. And that there were not 50 square inches of scale taken from that?

A. There was not any to my knowledge, and I was there all the time.

Q. Was there 25 square inches?

A. No, sir.

Q. How much?

236 A. What I saw was not a thirty-second.

Q. 10 inches.

A. I could not say what it was, but it would be less than 10 in.

Q. It would not be 25 or 50?

A. Not that I know of.

Q. You saw all that came off?

A. Yes, I saw all that came off.

Q. And if there was 25 square inches you would certainly know that?

A. No, I would not. I never saw it; it was a little scale.

Q. You would know that there could not be as much as 25?

A. In square inches?

Q. There could not be from your examination?

A. Yes.

Q. You are positive of that?

A. Yes, I am.

Q. You understand you are under oath?

A. Yes.

Q. Now, if it is a fact, Mr. Brennan, that the Federal government inspectors who inspected that, who were sent out by the United States government, made a report that there were about 50 inches of this scale on the crown sheet where it had evidently been washed up in a heap, then these district inspectors of the government were wrong?

A. They were wrong. What I saw was on the stay rod. I know where he seen it.

(Witness excused.)

237 R. SARTOR, a witness called by the defendant, having been first duly sworn, testified as follows:

Direct examination.

Mr. Dorety.

Q. Where do you live?

A. Gold Bar.

Q. What is your business?

A. Boiler maker.

Q. Working for the Great Northern?

A. Yes, sir.

Q. Had you made any inspection of the inside or upper side of the crown sheet of engine No. 1902 within a month or so prior to the explosion?

A. Yes.

Q. On what date?

A. October 16.

Q. That was about nineteen days before the explosion?

A. Somewheres around there.

Q. How was that inspection made?

A. Well, when they washed it out they took out all the washout plugs and we take a wire and have a light and put through these wash-out holes so we can see all over the top of the crown sheet by putting it in in each one of these holes.

Q. What are wash-out plugs?

A. Wash-out plugs are for the purpose of having a plug screwed into the boiler so as to be able to remove them and wash out the boiler.

Q. They are plugs in the fire-box portion of the engine?

A. Yes, on the sides and back.

Q. They can be screwed in and left in the holes of the fire box itself?

238 A. Yes.

Q. On your inspection on October 16 what was the condition of the box on top?

A. Good.

Q. Was there any scale on the crown sheet other than what is in place now?

A. No, sir.

Q. Around the sheet or around the bolts?

A. No, sir, the scale on the sheet was not any more than there is right now.

Q. Was the boiler washed out at that time?

A. Yes.

Q. How often are these washing-outs and inspections made?

A. They are made once every thirty days and sometimes oftener.

Q. Do you make them right along?

A. Yes, sir.

Q. Do you remember of ever seeing on an engine using Cascade mountain water scale around on the sheet or around the bolt which has caused the bolt or the sheet around it to heat?

A. No, I have not seen scale thick enough to cause anything like that.

Q. On the day before the accident did you make any inspection of this engine from the fire box?

A. Yes, sir, I was in the fire box.

Q. Could you see the crown sheet?

A. I could see the inside of the crown sheet in the fire box.

Q. Will you tell the jury whether there were sags in it such as we see now between the stay bolts in the holes or whether the sheet was all even as it is in the corners?

A. The sheet was even all over. The sheet looked to be in perfect condition to my knowledge.

Q. Was there any crown bolts leaking?

239 A. No, sir.

Cross-examination:

Mr. McCabe.

Q. You personally washed the boiler of engine 1902 on the 16th day of October, 1913?

A. No, sir, I inspected the boiler.

Q. Just explain to the jury what kind of an inspection that was, at what time of the day?

A. After the boiler is washed—They washed it out early in the morning, if I remember right, and they removed all these wash-out plugs. I don't exactly remember how many there is but there is ten of these plugs which can be removed in order to see the top of the crown sheet. They usually take considerable time in washing the boiler and after they are through it is my instructions from the foreman to take a light and examine the washing-out of the boiler.

Q. Did you have these ten plugs removed all at the same time?

A. Yes, sir.

Q. On the 16th day of October, 1913?

A. Yes, sir.

Q. They washed the boiler out in the morning and you made the inspection in the afternoon or the morning?

A. In the morning about 11 o'clock, if I am not mistaken.

Q. And then it is customary to fill the boiler after the plugs are put back in?

Q. Yes.

Q. Is it your duty to fill that boiler?

A. No.

Q. Is it your duty to know whether the boiler is filled or not?

A. Yes.

Q. The boiler was filled?

A. Yes.

240 Q. What time was the boiler filled?

A. I don't remember. It was just before dinner or right after 12 o'clock.

Q. In washing the boiler out, when the engineer comes in you have a work report which says "Wash boiler out" and then the boiler is washed?

A. Yes, sir.

Q. That is where you get your instructions from?

A. No.

Q. That is not true then?

A. What is not true?

Q. That the engineer reported this boiler to be washed?

A. I don't know whether the engineer reported it to be washed or not, but our instruction was to wash the boiler in a certain period of thirty days whether it is reported or not.

Q. You don't know whether this boiler was reported to be washed or not?

A. No, sir.

Q. Do you remember what boiler work was reported on the engine on the 16th day of October, 1913?

A. Yes, there was a small leak in the side sheet of the fire box reported leaking.

Q. It was reported leaking?

A. If I am not mistaken; I would not say for sure.

Q. Would you be surprised to know that this was all the boiler work on that day at Gold Bar would be an examination of the brick work?

A. I would not swear to it at all; it has been too long.

Q. You know you are under oath now? Do you remember what time that night a fire was placed in the boiler on the 16th?

A. Well, fire was placed in the boiler that afternoon some time. I don't know the time.

241 Q. For what purpose?

A. Expecting a call.

Q. Was the boiler filled with water, assuming that the water glass is an inch or two inches?

A. Yes.

Q. And the fire placed in the engine?

A. Yes.

Q. How long will it take in an emergency case to raise the pressure of the stream to 200 pounds?

A. From an hour and a half to two hours.

Q. Do you know with an inch and a half or two inches of water, how much water there is in the boiler, how many gallons, approximately?

A. I do not.

Q. You would not want to say it is a thousand or five thousand?

A. I do not know.

Q. Are you a boiler maker?

A. Yes, sir.

Q. Boiler makers on the Great Northern wash out boilers?

A. No, sir.

Q. You are still in the employ of the company?

A. Yes, sir.

Redirect:

Q. When work reports are put in who received them from the engineer?

A. The foreman.

Q. That would be the round house foreman?

A. Yes.

Q. So they might be put in without your knowing anything about it?

A. Yes, from the engineer.

(Witness excused.)

242 JOSEPH GIBSON, called as a witness by the defendant, sworn and testified as follows:

Direct examination.

Mr. Dorety:

Q. Your residence?

A. Gold Bar.

Q. Business?

A. Employed by the Great Northern as an engine inspector and hostler.

Q. Did you on November—on the evening of November 4, just before engine No. 1902 left on the trip which met with the accident, make an inspection of the crown sheet and crown bolts and fire box of the engine?

A. Yes, sir.

Q. What was the condition of the crown sheet as to its having any sags at any place between the bolts?

A. None whatever on engine No. 1902.

Q. Was it as even as it is now at the corners?

A. As even as that sheet is now?

Q. At the corners.

A. Yes, it was.

Q. Were there any crown bolts leaking?

A. None whatever.

Cross-examination.

Mr. McCabe:

Mr. McCabe: You mean November 4, Mr. Dorety?

Mr. Dorety: Yes, the evening before the accident.

Q. You were the inspector there that night of November 4, and the morning of the 5th?

A. Yes, sir.

Q. At Gold Bar?

243 A. I was the day man.

Q. The engine was not fired up that night?

A. I had taken the engine out of the round house myself.

Q. Do you know what boiler work was reported on her on that trip when she came in?

A. Yes, sir.

Q. Do you remember what it was now?

A. I think so.

Q. Will you state it please?

A. Some bolts were leaking in the fire box.

Q. They are over this crown sheet?

A. The rear rows.

Q. How many?

A. Somewhere between thirty and forty, but you can't always tell how many are leaking.

Q. Those bolts were repaired, were they?

A. Yes, sir.

Q. When you took the engine out of the round house they were all right?

A. Yes.

Q. There were no other leaks in the fire box when you took it out?

A. No.

Q. The fire box was in good condition?

A. To my knowledge it was in good condition, no leaks at all.

Q. There was not anything about looking into the fire box, into the interior of the fire box through the fire box door, that would cause you to be suspicious of the fire box?

A. No.

Q. It looked perfectly sound?

A. If it did not I would never put my head there.

Q. You had put your head there before? You could tell
244 how she looked?

A. Yes.

Q. You are still in the employ of the Great Northern.

A. Yes.

Q. How long have you been in the employ of the Great Northern?

A. Three years and two months.

Q. Have you been engaged as hostler all that time?

A. No, sir, not in this shop.

Q. I mean on the Great Northern?

A. Yes.

Q. Been an inspector?

A. Yes.

Q. Where did you come from?

A. I come from Canada.

Q. A good move, Mr. Gibson?

A. Yes, sir.

(Witness excused.)

C. E. McGRATH, recalled for further cross-examination:

Q. Mr. McGrath, referring to this matter again of Cole's experiments you were to examine so as to tell this jury if this figure 1-39 was the type of bolt head recommended by Mr. Cole. I want to ask you whether Figure 1-33 is not one of the types that he tried out and which he placed in a lower test of merit than 1-45?

A. I see no crown upon that particular type.

Q. You would judge from its being shown there it was one he tested?

A. Yes, I would.

Q. Can you see any difference between Figure 1-33 and the bolt which you show as No. 3 on plaintiff's Exhibit A?

A. It is the same type.

245 Mr. Dorety: May I have the jury look at that?

Mr. McCabe: No objection.

(Jury permitted to look at figure in book.)

Redirect examination:

Q. Were these same tests made under the same conditions as would obtain in an oil-burning engine?

A. They were not.

(Witness excused.)

J. J. DOWLING, called as a witness by the defendant, sworn and testified as follows:

Direct examination.

Mr. Dorety:

Q. You are a resident of what place?

A. St. Paul, Minnesota.

Q. What is your business?

A. Superintendent of safety for the Great Northern Railway Co.

Q. As superintendent of safety what are your duties?

A. My duties are to look after the business of the company in so far as safety appliances are concerned and wherever we discover anything which might be dangerous to eliminate the danger and make things as safe as possible.

Q. Your entire time is given to devising ways and means of safety for the employes and equipment?

A. Yes, sir.

Q. You have engine experience have you?

A. About twenty-seven or twenty-eight years.

Q. In what capacity?

A. Machinist, apprentice, fireman, locomotive engineer, round house foreman, general foreman, traveling engineer, master
246 mechanic and superintendent of safety.

Q. Would it be a part of your duty, for instance, to advise any change of type of the head of a crown bolt or to advise the installation of fusible plugs, if in your opinion they would add to the safety of the employes?

A. That is thoroughly one of my duties.

Mr. Zettler: I suggest that Mr. Dorety do not lead the witness.

Q. What experience have you had with the use of button head crown bolts on oil-burning locomotives?

A. My experience is confined to the Cascade division—that is actual experience—since we started to burn oil. I made inspection trips.

Q. Were you on the Cascade division as master mechanic when they started to burn oil?

A. Yes, sir.

Q. Have you been in touch with this engine since?

A. Yes, sir.

Q. Have you made examination of the use of the taper head crown bolt on other oil-burning roads?

A. Yes, sir.

Q. You have on the Southern Pacific?

A. Yes, sir.

Q. In your opinion which is the safer and stronger bolt in operation on oil-burning engines?

Mr. Zettler: I object to his stating which is the safer; he can tell his general conclusion, not as to whether it is safer or not.

Mr. Dorety: I think as an expert he can express an opinion.

The Court: I think the objection is well taken. Exception saved.

Q. In your opinion is the button head type of crown bolt a safe type to use?

Mr. Zettler: Same objection.

247 The Court: Overruled. Exception allowed.

A. It is the safest known to mechanical knowledge and experience.

Q. Did you examine the crown sheet of engine No. 1902 after the accident?

A. I did.

Q. What was its color and condition on the engine flues and bolts?

A. The crown sheet and the bolt heads and the top row of flues and the top flange of the flue sheet were a very deep blue.

Q. Has the Great Northern made any use of fusible plugs in crown sheets while you have been with them?

A. Yes.

Q. With what success.

A. We abandoned them. We found we had to; we found they were very unreliable.

Cross-examination.

Mr. McCabe:

Q. Your present position is safety official for the Great Northern?

A. Yes sir.

Q. And it is one of the duties of the safety first man, when he sees anything that might cause an accident, to recommend that that be removed?

A. Yes.

Q. The safety first was initiated about fifteen years ago on the Chicago & Northwestern, is that true?

A. That is not true.

Q. Isn't it true, Mr. Dowling, that Mr. E. H. Harriman did, in 1899, upon an inspection trip over their lines to the Pacific Coast, take in the Chicago & Northwestern and Chicago & Omaha, the Union Pacific, Central Pacific and Southern Pacific into San Francisco, and on that inspection trip he had occasion to talk to 248 section men, engineers, firemen, round house men, shop men, men working in the office, and when he would call their attention to a defect—we will *say* the engineer on an engine—and ask why it was not removed, he would say that he reported it and that is all that he could do, and Mr. Harriman then immediately wanted to know what was the trouble and who was to blame for the work not being done?

Mr. Dorety: I don't know anything about it. I would like to ask if the witness accompanied Mr. Harriman? * * *

Mr. McCabe: I will withdraw the last question.

Q. You were appointed to this position, Mr. Dowling, about the first of the year?

A. Yes.

Q. At the time of this boiler explosion on the 5th day of November, 1913, you were division master mechanic of the Great Northern?

A. Yes.

Q. Had been for how many years?

A. About eleven years.

Q. You were master mechanic when the change was made on this engine 1902 from coal to oil?

A. Yes, sir.

Q. And you were responsible for the button heads on the crown bolts still remaining in the engine after she was changed from coal to oil?

A. I was not.

Q. Who was?

A. The superintendent of motive power.

Q. You never had anything to say whether it was a satisfactory bolt or was not?

A. My recommendation and best judgment in the reconstruction I transmitted.

Q. You did make that recommendation?

249 A. I did after a test of two years as to the bolts over the country and sound. They are still in the engine. You can go down and take them out and test them after five years in oil work.

Q. You said on direct examination that you made a test upon the Southern Pacific?

A. Yes.

Q. Where?

A. Not tests, inspection.

Q. Where?

A. At Bakersfield, California.

Q. What did Mr. Shellborn tell you, of the San Joaquin Division, or at Bakersfield, in reference to this bolt, the button head, as shown in Plaintiff's Exhibit A, plaintiff's Exhibit 3?

A. I have not seen these bolts that question refers to and I would like to look at them.

Q. You may do so. As safety first I think you should.

A. (Witnesses examines Plaintiff's Exhibit A.) That is not a boiler bolt at all.

Q. What is not a boiler bolt at all?

A. The one you have exhibited as a Southern Pacific bolt is not a boiler bolt. It would not be permitted to be used. It is not a boiler bolt head.

Q. The same kind of bolt as you use over here?

A. No, sir, it is not. That exhibit may show it the same but the threads indicate it is not a boiler bolt. The man that drew it didn't know what he was doing.

Q. Would you say this is a boiler bolt, crown bolt?

A. No, sir, I would not, because the threads are not turned, are not shown, as a boiler thread; it is a machine thread.

Q. What kind of thread?

A. Twelve threads to the inch; this is eight threads to the inch.

250 Q. How many threads are there there on the sheet?

A. There would be two and a half.

Q. How thick is that sheet?

A. Three-eighths, I presume. I was guessing.

Q. It should be marked five-eighths?

A. It is three-eighths.

Q. So that neither one of these bolts is correct?

A. No, not the way you have them shown. If the man drew them for a boiler bolt he was wrong.

Q. Leave the bolts out. We assume that your bolts were A-1 and will talk about the heads.

A. All right.

Q. Is it not a fact that this is the kind of head that is used on the Southern Pacific (ind.)?

A. No, sir.

Q. What kind is used? Take your pencil and enlarge it as much as you like, Mr. Dowling.

A. This head here might be, and it is enlarged just a shade. I think it would be one-sixteenth of an inch larger.

Q. That is the kind of a head that the Southern Pacific uses?

A. No, sir, not entirely.

Q. What you are drawing is going to be?

A. I do not state that is the only kind of a head they use.

Q. You will state that that is the standard head?

A. No, sir, that was a button head.

Q. Did you see a button head, Mr. Dowling, on any engine working at Curran, California?

A. I was not there.

Q. When you say Bakersfield you mean Curran—or Bakersfield if you wish to call it that?

A. Yes.

Q. Was there a single engine working out of there with
251 crown bolts in her with a large head like this, in oil?

A. I don't think they—I went to look at one engine and that was the one in the explosion, but the master mechanic informed me that they run both bolts. This was an oil burner that exploded.

Q. Then you went down to look at a boiler explosion and make an examination of what kind of a head they used?

A. I went down to see what we would learn from the explosion in reference to adopting any points we could in reference to safety.

Q. You have reference to the explosion that occurred seven and a half miles east of Curran City, California, between the cities of Edison and Taxis, on the San Joaquin Division?

A. I don't know what you are talking about. The explosion I refer to was four miles south of Bakersfield. I don't know what division it was on. I don't know where Curran is.

Q. Isn't it a fact that everything on the Southern Pacific, except going away from the city of San Francisco, is going east, so far as the rules are concerned?

A. I don't know.

Mr. Dorey: I object to the question as immaterial.

The Court: It is already answered.

Q. The boiler explosion you have reference to happened on the Edison and Taxis line?

A. It is four miles or four miles and a half east of Bakersfield. I didn't go to the site of the explosion. I saw the boiler at Bakersfield. You call it Curran. I was under the impression that I was at Bakersfield, California, when I inspected that boiler. The boiler was changed the same portions as ours and it had this kind of a head with two fusible plugs in the crown sheet.

Q. Fusible plugs in the crown sheet would not have prevented this particular explosion in engine No. 1902?

A. I never saw them prevent any explosion.

252 Q. I asked if it would have prevented this particular explosion?

A. I hardly think it would for I never saw them prevent any explosion.

Q. You examined the crown sheet on the 5th, that was the day it came down?

A. No, I didn't. It was two days later when I saw it.

Q. At Skykomish or Delta?

A. It was at Delta. I was out on the road at the time of the accident.

Q. Do you remember, Mr. Dowling, that none of these rivets were burned in any manner?

A. They were.

Q. You remember that the first row of crown bolts—

A. May I step down there?

Q. —Just a minute. You remember the first row of the crown bolts that none of the heads were broken off?

A. (Steps down to crown sheet.) When I examined this crown sheet and the flange of the flue sheet I wondered if there would not be blue in there where the rivets had been pulled, and they were as I expected then, highly colored blue. These bolts that went in those four front rows which are in front, they are a button head crown bolt just the same as the balance, as far as the head is concerned—the head is identical with the others—but they are not threaded in the sheet; they are driven.

Q. In your examination of the crown bolts that were removed from this portion, the portion that is flanged, about how many did you find to be good bolts, good heads on them, that didn't show any signs of heat at all?

A. I cannot say that I saw any that didn't show signs of heat.

Q. All of these without any exception were all highly overheated?

A. They were all blue at the time, those that I saw. You understand there were some that had been blown away.

253 Q. Does the sheet look the same now as it did when you inspected it?

A. With the exception of the piece that was cut out for testing purposes, it does.

Mr. Zettler: Will the court permit me to ask a few questions?

The Court: You may cross-examine.

Mr. Zettler:

Q. Mr. Dowling, I understand you to have stated that you were master mechanic and the superior of the deceased at the time of this accident?

A. Yes, sir.

Q. You had charge of the engines and had charge of the engineers?

A. Yes, sir.

Q. I will ask you whether it is a fact that the United States government has inspectors upon your road, Federal inspectors?

A. They have.

Q. Do they examine the operation of your road, the operation of the engines, and make reports?

A. Do you want that answered in detail?

Q. Answer Yes or No.

A. Yes, sir.

Q. They are not employed by the Great Northern?

A. They are employed by the government.

Q. They have a careful supervision, have they not?

A. They have a general supervision the same as any other person would have who has four or five states or two or three to cover.

Q. And if they observe defects they are rigid in their requirements?

A. They are not as rigid in their requirements as we are in a great many cases. For instance they only require the testing of steam pipes every three months where we test them every month.

254 Q. Where they have discovered a serious defect they will take that engine out instantly?

A. They have that authority.

Q. Do they do it?

A. I don't know of any case where they did it. I don't recall of any case where they took an engine out; they never took this engine out.

Q. So far as you know, they are impartial as government employees?

A. As far as I know.

Q. As far as you know they are impartial?

A. Yes.

Q. Are they experts?

A. If you might call them so. They are made up of engineers who have had as much experience as Mr. McCabe. I don't know.

Q. Do you know whether they have had experience in this case?

A. I don't know.

Q. Do you think they have, what is your impression?

A. No, I don't. You ask me if I know, but I don't.

Q. Have you ever seen a Federal inspector?

A. Yes.

Q. Have you ever observed an inspector?

A. Yes.

Q. Would he act as though he knew what he was doing or not?

Mr. Dorety: I object, it is immaterial.

The Court: Sustained.

Q. In their reports, as far as you know, they are not prejudiced one way or the other?

A. I don't think they are.

Q. Your testimony here is that this crown sheet showed signs of overheating, when you examined it?

A. Yes, positively so.

Q. You are positive about that?

255 A. I said so.

Q. What color did the crown sheet have that showed these signs of overheat at the time you examined it?

A. A deep blue.

Q. Plainly observable?

A. Yes.

Q. Any person could see it?

A. Yes, sir, any person could see it.

Q. You would say then that this deep blue color on that crown sheet would be caused by low water?

A. I would say so; yes, sir.

Q. You would also say that it has lost its blue color now? It has no blue color now?

A. Yes, sir.

Q. When did you examine it when it had a blue color, how long ago?

A. About two days after the accident, about the 7th.

Q. Did you see any scale on the boiler, any large amount of scale on the boiler?

A. The sheet was just exactly as you see it there before you.

Q. With the same color?

A. Except the color—as far as the scale is concerned. You are talking about scale on the sheet.

Q. Was there a low water line?

A. There was.

Q. You are sure of that?

A. Yes, sir.

Q. Then if the report of the Federal government inspectors on this accident states positively that there was no indication of overheat on the crown sheet, then they were wrong?

A. Their opinion—They are entitled to their opinion as well as I am.

256 Q. I will ask you if you state positively now that there were indications of heat on that crown sheet when you examined it?

A. Yes, sir.

Q. They could not be mistaken, it was a deep blue color, was it not?

A. Yes, sir.

Q. Then if they state that no indications of overheat were observable on the crown sheet, they were wrong?

A. I would not believe them.

Q. Then if they state that they could not find a low water line, then they were wrong?

A. I would not believe them.

Q. Then if these inspectors employed by the government further state that there was no evidence of overheat except on bolt heads, they were wrong?

A. I would not believe them.

Q. If these two Federal boiler inspectors further state "That an examination of the fire box failed to disclose any line of low water

and no evidence of overheat on the crown sheet except around the crown bolts holes where the threads show a little blue," they were either blind or falsified?

A. They were as much entitled to their opinion as I am now.

Q. I am asking you if the indications on that crown sheet could be mistaken?

A. As far as I could see or any other man that was not prejudiced.

Q. Then you would say that the boiler inspectors sent out by the government were prejudiced?

A. I don't say anything of the kind.

Q. Would you say that?

A. No, sir.

Q. Would you say that an ordinary man could see the blue color?

A. I would say that an ordinary man could see it.

Q. Could the boiler inspectors have seen it?

257 A. Yes.

Q. Then when they say that there is no evidence of overheat on the crown sheet, they mean that it was not a blue color as you say must have been on there?

A. I don't know what they meant by saying it.

Q. Do you understand the English language?

A. Yes, I do as well as you do.

Q. Do you know what the words "No evidence of overheat on the crown sheet" means?

A. Yes.

Q. What does it mean?

A. That there was no evidence of overheat on the crown sheet.

Q. What does that mean in regard to color?

A. That would mean that there was no more color than there is at the present time.

Q. And you say there was color?

A. I say there was color.

Q. Would you also state that the inspectors for the Federal government were wrong and that you were right if you are testifying truthfully?

A. I didn't say anything of the kind.

Q. Let me finish the question.

A. Yes.

Q. They were wrong when they said this: "And if, as the Great Northern officials claim, this accident was due to low water, we cannot account for the absence of heat on the highest part of the crown sheet and the flues which are 20 feet long, the top rows of which must have been entirely exposed if the water was low enough to uncover the sheet to within one row of crown stays of the back end," then you cannot agree with them?

A. If he was there and stopped to consider he would very easily discover that you would not *bring* the flame in the fire and
258 bring your draft, as witnesses explained it two or three times, *but* over the high point. As a matter of fact you cannot heat the high part of the crown as much as you can the center from ordinary practice of the engine in service.

Q. Would you say, therefore, that the entire crown sheet was absence—that there was an absence of color over the entire crown sheet?

A. There was what?

Q. An absence of color?

A. At what time?

Q. At the time you examined it after the accident?

A. The entire crown sheet was blue, and the flange of the flue sheet over about one-half or about the center of the top row of flues.

Q. Unmistakably blue?

A. Yes.

Q. Then you are of the opinion that this is a low water failure?

A. Positively, yes, sir.

Q. And your opinion is based upon the fact that you say that that sheet was blue?

A. Not entirely, no.

Q. Was that one of the material facts?

A. That was one; yes, sir.

Q. If there were no blue color on that crown sheet would you say it was due to low water?

A. I would not.

Q. Would you say it was due to some other cause than low water?

A. Yes, if it showed any signs of heat.

Q. It must be a blue color?

A. Yes.

Q. Which any one can see?

A. Yes, sir.

259 Q. Then if the opinion of the Federal inspectors is as follows: "Therefore, we are of the opinion that this was not a low water failure, but a failure due to the button heads being exposed to the intense heat of the oil fire and the life or strength burned out of them, allowing the heads to pull off," then they do not know what they were talking about?

Mr. Dorey: I object to it for this reason: I have sat here listening on this occasion and several other occasions to counsel reading from some typewritten copy or fictitious typewritten report, not knowing where it came from, insinuating in the question that it came from some government official or some mechanical engineer in the east, and attempting to give the jury that idea, attempting to get it in as evidence without there being any evidence or proof of it. Now I am aware that the court will allow great latitude in the matter of cross-examination and that the attorney will be permitted to make up a thing if he wants to and ask a witness almost any form of question, such as "Didn't so and so say such a thing," whether he believes it or not, and the question is not one that is perhaps objectionable, but it is in the discretion of the court how far that sort of thing should go. If counsel has anything, any documents of this sort, he *he* can offer them in evidence without insinuating them, or make proper offer at the proper time. If he

has not it seems to me that this practice has been carried beyond the fair limit and that the court should take a hand. I object, it is passing the privilege of cross-examination.

Mr. Zettler: Would you be willing to allow this report to go in the record if it is the actual report of the Federal inspectors?

The Court: I will sustain the objection. I will say this to counsel: That I think there has been on both sides a whole lot of
260 examination that serves no good purpose but it is not for me to raise the objection. Exception allowed.

Mr. Dorety: I will say in explanation that I do not want to appear as objecting unless it reaches an improper limit.

Mr. Zettler: May I prove at this time that this is the report? Do you refuse to allow me to prove that this is the actual report?

(Typewritten copy which counsel holds in his hand.)

Mr. Dorety: Ask the court. You make your application.

Mr. Zettler: I make application now to put Mr. McCabe on the stand to show that this is the actual report of the Federal inspectors, signed by John B. Brown and Robert E. Higgins, district inspectors, after making the inspection.

The Court: You may have permission to call Mr. McCabe.

(Witness excused from stand.)

JAMES MCCABE, recalled for further direct examination.

Mr. Zettler:

Q. Did you make application to the Federal inspectors who examined this crown sheet for their report on the accident?

Mr. Dorety: I object to the question as incompetent, irrelevant and immaterial.

The Court: It is preliminary. Exception noted.

Q. Did you receive that report?

A. I did.

Q. Is what I hand you now (Handing witness typewritten copy) the report of the Federal government of this accident that you received? Look it over.

Mr. Dorety: I object to the question on the ground no sufficient foundation has been laid, and on the ground it is incompetent, irrelevant and immaterial.
261

The Court: Overruled. Exception noted.

Q. Answer the question.

A. Yes, sir.

Mr. Zettler: Have you any objection to my offering it, Mr. Dorety, in evidence?

Mr. Dorety: I certainly have.

Mr. Zettler: Did you not say in your opening statement that we could produce it and offer it in court?

Mr. Zettler: We now ask Mr. Dorety to take the stand on our behalf.

The Court: For what purpose?

Mr. Zettler: For the purpose of asking him whether he said in the opening statement to this court and jury that this report could be obtained and introduced before this court and jury.

The Court: That application is denied. Exception allowed.

Mr. Zettler: I now ask the stenographer to turn to the opening address of Mr. Dorety and read that portion that you have marked, that I have called to your attention.

The Court: For what purpose do you make this?

Mr. Zettler: For the purpose of showing part of counsel's opening statement.

The Court: That application to the reporter is denied. Exception.

Mr. Dorety: In addition to the objection I have made I would like to have the record show an exception on my part to the last cross-examination and the last two or three applications of Mr. Zettler as misconduct.

The Court: I have no disposition whatever to prevent either side from having proper exceptions; in fact, I want both sides to have any exceptions proper to be taken; but if you are going to try a law suit it must be tried somewhere in accordance with the general rules as we understand them. This is a pretty general
262 exception to propose at this time.

Mr. Dorety: It is a matter that I would pass over if it were not for the way counsel has attempted to get in improper evidence which he knows is improper, by means of cross-examination, and purporting to read from documents which he knows are not admissible to our witness and then making the applications he has made. I believe this to be a direct attempt to influence or prejudice the jury by improper evidence and misconduct, and I except to it as such.

The Court: The record shows the exceptions you have taken and it may stand in that condition.

Mr. Zettler: May I ask the court to put in the record the fact that counsel made no request at any time for the withdrawal of the jury.

The Court: The record shows that no such request was made.

Mr. Zettler: And that no objection was interposed except the one—

The Court: The record shows the objections that have been interposed and all exceptions that have been taken. There is no necessity for having it show anything further.

(Witness excused.)

J. J. DOWLING recalled.

Cross-examination:

Mr. Zettler: As I understand the ruling of the court it is that the objection was sustained to the asking of this sort of questions

because it was not shown whether it was hypothetical or whether I was just making this up, do I understand that?

The Court: You may — the question and the court will rule upon any objections made.

Q. Mr. Dowling, is it a fact that you have testified that this crown sheet had blue color when you examined it?

263 A. That part which I described, yes.

Q. Was it a large or small portion?

A. It was the large portion and the edge of the flange on the high part of the sheet.

Q. And it is a fact that the large part of the crown sheet was of a blue color?

A. A large part of it was, yes.

Q. It is also a fact, is it not, that the bolt heads were of a blue color?

A. Yes, sir, that is the heads that we have.

Q. That is the heads that came out?

A. You know there are a number of heads we never found that blew away.

Q. Then your testimony is that the bolt heads and the crown sheet was to a large extent of a blue color, that is your positive testimony?

A. Yes.

Q. Your final testimony?

A. Yes.

Q. You state your opinion as an expert, do you not, as a fact that button head stays, such as marked on Figure 1 of Plaintiff's Exhibit A, give as good or as satisfactory results, give better results, than the type or class of button head indicated on the same exhibit by No. 3, is that a fact?

A. Yes sir.

Q. That is your opinion as an expert?

A. It is a stronger bolt than the bolt No. 3.

Q. I didn't ask you for an explanation; I asked you *and* answer the question whether or not in your opinion—You may examine after the trial to your heart's content—I am asking you whether it is your opinion that the crown bolt head as indicated on Figure 1 is superior in oil-burning engines to the crown bolt as indicated on Figure 3?

264 A. If I didn't believe that, as superintendent of safety, I would recommend that it be taken out.

Q. Answer it "Yes" or "No."

The Court: I think this question can be answered "Yes" or "No."

A. It is my belief that that is the better bolt.

Q. That is your opinion?

A. Yes.

Q. Then do you know whether or not your opinion is supported by authorities?

A. It is supported by five years' actual trial in oil.

Q. Answer the question, do you know whether or not your opinion is supported by authorities? Answer "Yes" or "No."

A. Yes.

Q. You do know that?

A. Yes.

Q. Do you know whether or not there are authorities contradicting your opinion? Do you know that?

A. Well, I have read of one or two. I never considered the source of great authority.

Q. Are they considered so?

A. They may consider so.

Q. Do you consider them so?

A. No.

Q. You do not consider them as authority?

A. Not those I have seen.

Q. Then it is a fact, is it not, Mr. Dowling, that you do not know of any authorities that are contrary to your opinion, what you would consider an authority?

A. I have never read but one real authority but said that they believed that sort of bolt was stronger than the taper bolt, and
265 I never considered him an authority; I never saw him quoted before.

Q. You say "stronger" Mr. Dowling. My question is whether the bolt is better in oil-burning engines or not, not whether one is stronger, but whether one is better gives more satisfactory use?

A. You were not speaking——

Q. I am speaking about durability, about its use.

A. Yes.

Q. Do you understand the question?

A. Yes.

Q. I will now ask you whether you know of any authorities, what you consider authorities, to the effect that the crown bolt head, as indicated by Figure No. 3, substantially, on plaintiff's Exhibit A, is a better and more satisfactory bolt head to use in oil-burning engines than the one indicated on Figure 1 of the same exhibit?

A. No.

Q. You do not?

A. No.

Q. Would you know of any if there existed any?

A. I would not when there are so many. There may be fifty or one hundred.

Q. Would you consider the chief inspector of locomotive boiler inspection division of the Interstate Commerce Commission of the Federal Government an authority on this sort of questions?

A. No, not particularly, unless I knew the man's experience. If he had had experience covering a long period of time, but if he was speaking from technical knowledge I would have to be satisfied in my own mind; if he didn't get such from actual experience I would not be.

Q. Would you say that this official, the chief inspector of locomotive

266 tive boiler inspection division of the Federal government, would know or would have an opinion that is worth while as to which kind of head is the better type to use in oil-burning engines?

A. He might have an opinion worth while. I admit any man is entitled to an opinion.

Q. If it is his opinion, not shown by any report, that it is his opinion that——

Mr. Dorety: May I interrupt? I am going to object to any further reference to that sort of cross-examination. As I said before, the court has the discretion to put a stop to it, and I do believe when counsel takes a typewritten piece of paper and reads from it it is improper and unfair.—

The Court: I will do this in the matter, I will permit counsel to complete the question and then I will hear the objection. Exception.

Q. If it is, Mr. Dowling, the opinion of the chief inspector of the Interstate Commerce Commission, division of locomotive boiler inspection for the Federal government, not expressed or based on any record of any accident, that it has been found by tests of these two designs in the use of oil for fuel that button head stays on crown bolts do not give as good results as a bolt with a smaller head, would that be in accordance with your opinion on the subject?

Mr. Dorety: Now, I object to the question on the ground that it is unfair for any attorney to take a piece of paper with something written on it, which he knows is not admissible, have a paper and go before a jury and look at it and read it and purport to be reading from some document of that sort in cross-examination.

The Court: The trouble with your objection is you have stated you assume certain things to be true that I have no knowledge of.

267 I don't know whether counsel holds in his hand his private memoranda or something else which he has.

(Argument by Mr. Dorety.)

The Court: I do not think it is any proper cross-examination. I cannot for the life of me understand how it will aid this jury one bit to get the opinion of this witness upon the opinion of anybody else, or whether he agrees with somebody else, or if it doesn't agree with somebody else. If you wish to deal with some one text book and examine the — with reference to that then I think that is proper cross-examination. I will sustain the objection. Exception allowed.

Q. Mr. Dowling, you are still in the employ of the Great Northern Railway Company?

A. I am, yes, sir, but that does not influence my testimony.

Redirect examination:

Q. Mr. Dowling, did you have any conversation with the chief boiler inspector of the Federal government as to the cause of this accident?

A. I had a conversation with the chief boiler inspector of the United States in the State of Washington regarding this accident, and he informed me—

Mr. Zettler: I will ask the court to admonish the witness that he is not to give hearsay evidence. I object to the witness—which he is evidently going to do—stating what the chief boiler inspector told him witness in view of the court's ruling.

The Court: That will be sustained.

Q. I will ask you this, Mr. Dowling: From what you know of the duties of the Federal inspectors, if they considered that type of construction insufficient, would it be their duty to take our locomotive out of service?

A. I would state that as I understand the duties of this inspector he would be in duty bound to take the engine out of service immediately if he considered any part of the construction defective.

(Witness excused.)

268 Mr. O'LEARY recalled for further direct examination.

Mr. Dorey:

Q. Were you present when the inspector for the United States examined engine No. 1902?

A. I was.

Q. What was the color of the sheet at that time?

A. It was blue; part of it was blue, a deep blue.

Q. Can you state whether or not, from discussion, he was satisfied that that was the fact.

Mr. Zettler: I would ask of counsel whether the attention of the Federal boiler inspector was called to that?

The Court: Sustained. Exception allowed.

Mr. Dorey: I think it would follow up the cross-examination of the last witness, and in view of the impression that counsel has tried to create improperly it would be no more than fair.

The Court: Your argument in favor of your position upon this question is based upon something that I cannot take any notice of. I presume that this jury will try this case according to the evidence which is admitted.

Mr. Zettler: I ask the court to instruct the jury at this time that they are not to take into consideration the statement of counsel as to whether or not we are trying to mislead the jury.

The Court: The jury will be instructed at the proper time what they will take into consideration in arriving at their verdict.

(Witness excused.)

J. B. DAVEY, called as a witness by the defendant, being first duly sworn, testified as follows:

Direct examination.

Mr. Dorety:

Q. Where do you reside, Mr. Davey?

269 A. 41 Aldrich Avenue, North Minneapolis, Minnesota.

Q. What is your business?

A. General boiler inspector of the Northern Pacific?

Q. Are you familiar with what has been referred to in this case as fusible plugs?

A. (No answer.)

Q. Are you familiar with the device known as the fusible plug which has been referred to in the evidence?

A. I have been some years ago.

Q. Do you use them on your roads?

A. We do not.

Q. Do you know of any roads outside of the Southern Pacific that does use them?

A. I do not.

Q. Did you examine engine No. 1902, or the crown sheet of it?

A. I did.

Q. Did you find any indications of heat on the crown sheet, the flue sheet of the engine?

A. I did.

Q. Will you state to the jury what they were?

A. In examining the fire box we found the fire box in good condition on the lower part of the side sheets and door sheet and the lower part of the flue sheet. On the top part of the flue sheet the flange was sprung out, I should judge, five-eighths of an inch.

Q. The flange is where the flue sheet and crown sheet come together?

A. Yes. And the top row of flues, I think six in each, the six of these flues were sprung away, and the flue itself sprung away and the piece was blue half way down the flues.

Q. What in your opinion, was the condition of the crown sheet at the time of the explosion as to temperature?

270 Q. What was the temperature?

A. Yes, as to whether it was the temperature of water or hotter?

A. It was much hotter. I should think it was red hot.

Q. Could it attain that temperature with water on it?

A. It could not.

Cross-examination.

Mr. McCabe:

Q. What day did you make the inspection?

A. I think on the 8th day of December, 1913.

Q. If the crown sheet was red hot, wouldn't the sheet have pulled over the heads of the bolts instead of the bolts pulling off?

A. It would not.

Q. What color was the crown sheet?

A. I should judge when we inspected it it was a dark blue.

Q. In color it was as dark as it is now?

A. Not as dark.

Q. There is not sufficient color now to tell that it was ever burned?

A. Yes, I believe I could tell. Not by the color but by the condition.

Q. Not by the color?

A. Not by the color.

Q. You are still employed by the Northern Pacific?

A. I am.

That is all.

J. M. DAUGHERTY, called as a witness by the defendant, sworn and testified.

Direct examination.

Mr. Dorety:

Q. Where do you live?

A. Manette.

271 Q. Over near Bremerton?

A. Yes.

Q. What is your occupation?

A. Boiler maker by trade.

Q. What is your business at the present time?

A. Estimator for the United States government at the Navy Yard.

Q. Estimator of boiler work?

A. Different classes of work.

Q. How long have you been engaged in boiler work?

A. Since '82.

Q. Can you state whether or not on naval vessels whether fusible plugs are permitted on the United States naval vessels burning oil?

Mr. Zettler: I object to that question on the ground that no proper foundation has been laid to show a similarity, to show whether all the conditions are pertinent to this line. If he shows that the conditions are substantially the same as here the question will be proper.

Q. Are you familiar with the device known as the fusible plug? Do you know what it is?

A. Yes, sir.

Q. Are you familiar with the type of boilers used by the United States naval vessels burning oil?

A. In the United States vessels, controlled by the Navy, it is not permitted.

Mr. Dorety: I did not want to go into that now.

Mr. Zettler: I move to strike the answer.

The Court: It will be stricken.

A. Do you know? Just say "Yes" or "No." Do you know what kind of boilers they use?

A. Yes, sir.

Q. They burn oil in some of them?

272 A. Yes.

Q. Now with that type of boiler, would a fusible plug which would work in a locomotive boiler serve the same purposes in the type of boiler they use?

A. Yes, sir.

Q. Then, I will ask you whether it is a fact that the United States government permits the use of fusible plugs on its vessels?

Mr. Zettler: May I ask Mr. Daugherty whether the conditions are similar as to the use of fusible plugs?

Mr. Dorety: I thought I covered the field. You may ask the question if you desire.

(By Mr. Zettler:)

Q. Are the conditions in regard to safety fusible plugs, the propriety of using safety fusible plugs in land jurisdiction, inland, such as locomotives, and on water, such as ships, about the same in inland waters? Are they the same in inland waters?

A. They are the same in inland waters.

(By Mr. Dorety:)

Q. Will you state whether or not the United States government permits the use of safety fusible plugs on vessels burning oil in the United States navy?

Mr. Zettler: I have no objection to that question if he confines it to inland waters which are shown to be the same.

Q. All right, confine it to vessels of inland waters, that is United States naval vessels.

A. They do not allow it; that is on vessels controlled by the navy.

Q. Have you examined this crown sheet, Mr. Daugherty?

A. Yes.

Q. The bolt heads that came out of 1902?

A. Yes.

Q. From that examination what would you say as to the temperature of the sheet just prior to this explosion?

273 A. I would say that it got what you would call a black dull red.

Q. Would it be hotter than it would be with water on it?

A. Yes.

Q. Would it be possible for it to attain that temperature with water on it?

A. No, sir, it would be impossible.

Cross-examination.

Mr. Zettler:

Q. On your direct examination you testified that the conditions are similar in regard to vessels as to locomotives, is that right?

Q. What?

Q. Did you testify in your original examination that the conditions are similar for the use of safety fusible plugs in oil-burning boilers on vessels as well as on locomotives?

A. On inland waters.

Q. That is your testimony?

A. Yes.

Q. There is no reason then so far as you know why a fusible plug should not be used on vessels or should not be used on vessels which reason would not apply to locomotives, is that a fact?

A. You will have to make that a littler plainer.

Q. Very well. I want you to understand me. Is there any reason that you know why a fusible plug should not be used on a vessel when they should be used on a locomotive?

A. Did you speak of a naval vessel?

Q. Any vessel in oil burning?

A. You have not got the question framed for me.

Q. Do you understand what I say?

A. You are limiting me to vessels of inland waters, controlled by the government as well as vessels by the navy?

274 Q. I will ask you this and I will repeat the question: Do you know of any reason why fusible plugs should not be used on vessels that would not apply to locomotives? If you do not understand it tell me.

A. I want to give that in, any conditions that the government has as to similarity or that are different?

Mr. Dorety: May I make a suggestion: Could you ask him about some physical condition?

Q. I will ask you this: The same reasons that would make a safety fusible plug undesirable on a vessel apply to locomotives, the same reasons for not using them on the vessel and the locomotive?

A. A government vessel?

Q. Any vessel?

A. I would not answer it that way.

Q. Can you answer that question?

A. They do do it.

Q. I ask you if there is any difference in the reasons. Let me explain if they do not use fusible plugs on marine vessels, there is a reason, there are reasons for that, are there not?

A. Government marine vessels?

Q. I am asking you in regard to marine vessels. I am asking you is there any reason why they do not use them?

A. They use them; the navy doesn't use them. The navy does not permit it.

Q. And what is the reason?

A. Because an engineer officer is so perfect and so brought up that he is not supposed to be subject to that test.

Q. Is that the only reason?

A. The only reason.

Q. What they call the "blue law," that is the only reason?

A. Yes.

275 Q. Because the officials of the "blue law" working on naval vessels are experts?

A. Experts.

Q. You know of no other reason?

A. No other reason.

Q. Are you familiar with the authorities on marine boiler management and construction?

A. By whom?

Q. Any of the authorities.

A. Yes. I am familiar with two or three.

Q. Are you familiar with Stromeyer?

A. No.

Q. You are not familiar with Stromeyer on Boiler Management & Construction?

A. No.

Q. You do not know of the third edition of his work here in 1907?

A. No, sir.

Q. If he states that on a ship with only one boiler, such a mishap as the single fusing of a plug might lead to her total loss, but always under any circumstances which are likely to occur at sea, it would be better to have the use of boilers which can be worked, even for one day, at very little pressure than not to use them at all until a new fusible plug has been inserted, would you admit then that this author is an expert?

A. I would.

Q. When did you inspect this crown sheet?

A. Part of that I inspected in February or January, that part that was cut out.

Q. Of what year?

A. This year.

Q. And the other part?

276 A. Just saw it the other day.

Q. What day?

A. The day before yesterday.

Redirect examination:

Q. Mr. Stromeyer is the same gentleman that counsel has been referring to, who states on page 129 "It is very well known that fusible plugs in boilers are not as reliable as they should be," is that about correct?

A. That is right.

(Witness excused.)

The Court: Members of the Jury, subject to the instructions heretofore given you, you will now be excused until 1:30:

Afternoon Session.

C. B. PADDOCK, called as a witness by the defendant, sworn and testified as follows:

Direct examination.

Mr. Dorety:

Q. Where do you reside?

A. Portland, Oregon.

Q. What is your business?

A. Chief inspector of the Hartford Steam Boiler Insurance Co.

Q. Your company insures boilers against explosions?

A. Yes, sir.

Q. What is your district over which you are chief inspector?

A. Oregon, Washington, Idaho, Montana and Alberta.

Q. What experience have you had in connection with boilers?

A. I have had something over twenty years.

Q. In what capacities?

277 A. In the capacities of chief of employes testing boilers, supervising construction of boilers, supervising the inspection of boilers, inspecting boilers, and supervising the inspection of boilers.

Q. Is it part of your duty to examine boilers before issuing insurance on them to see that they are properly constructed?

A. We examine the boilers before issuing insurance upon them.

Q. Do you make any examination of boilers insured by you which explode?

A. We examined every boiler that explodes that is insured by our company.

Q. How many boilers, could you say, have come under your jurisdiction I mean?

A. How many boiler explosions?

Q. In the past?

A. Possibly fifty.

Q. Have you examined the crown sheet of engine No. 1902 which is here in the court room?

A. I have examined the sheet that is in front of me.

Q. Have you examined the stay bolts or crown bolts and heads which were stated here as coming from that engine?

A. I have examined some of the bolts which were stated came from that engine.

Q. Can you tell from your examination whether the sheet and bolts and heads which you examined had been heated above normal, which the conditions indicated an explosion?

A. I could tell from the condition of the sheet before me that it has.

Q. What would you say the temperature of the sheet had been?

A. Approximately 1,300 degrees.

Q. Would that be red hot?

A. Yes.

Q. Would it be possible for a sheet to reach that temperature with water on it?

278 A. No.

Q. What are the indications from which you make that deduction?

A. The distorted condition of the sheet.

Q. Won't you go into a little more detail?

A. In my opinion it would be impossible for a piece of steel of that nature to distort in that condition without rupturing.

Q. It won't you mean at what temperature?

A. A temperature at a normal steam heat.

Q. That would be a temperature of about 380 degrees or so?

A. Between 380 and 390 degrees.

Q. It is your opinion that at that temperature the sheet could not be stretched that way without tearing the sheet?

A. That is my opinion.

Q. In your opinion could the sheet of that thickness and of that material be caused to take the sag as that has between bolts if it were in the temperature you have just named?

A. Not with normal pressure.

Q. With a pressure of 200 pounds?

A. No, sir.

Q. Have you examined the shape and size of the holes and the condition of the thread around the holes near the lower edge and the upper edge of the sheet?

A. I have examined some of the thread openings in the center of the sheet in the bulged portion.

Q. What does it indicate?

A. It indicates that the sheet stretched and permitted the bolt to slip through it.

Q. Would that indicate as to whether it had been heated above normal steam temperature?

A. Yes.

Q. What does that indicate?

279 A. It indicates that the sheet had been heated to a considerable degree of temperature.

Q. What would you say as to the presence of scale around the flat portion of the sheet and the absence of it on the bulged portion?

A. The high temperature would have a tendency to loosen the scale and the liberation of the contents of the boiler would possibly throw it off.

Q. Would a piece of scale thick enough to pay attention to cause any damage 50 square inches or 25 square inches in the crown sheet have any effect that could be detrimental?

A. If that scale were localized at one particular spot and the boiler run under ordinary circumstances it might have a tendency to buldge the particular spot.

Q. Will you tell the jury why that would be so?

A. By the lodgment of scale on the water side of the bolt the bolt would become interrupted from the water, it would heat it, and the

pressure on the inside of the boiler would have a tendency to bulge it down.

Q. Cause it to bulge at a particular place where the scale would gather?

A. Yes.

Q. Do you find any evidence on this sheet of scale?

A. No, sir.

Q. Is there sufficient scale on the edge of this sheet to cause any damage?

A. No.

Q. Would it have any detrimental effect at all on the sheet?

A. It could have none.

Q. Can you tell the jury approximately what would be the difference in the temperature of the two sides of the crown sheet in operation, assuming that you have a temperature of an oil fire 280 below and water and steam under 200 pounds' pressure above?

A. I would not expect to be able to find any increase in temperature if the sheet were clean and the boiler filled with pure water.

Q. By increase in temperature you mean any difference in temperature between the upper surface and the lower surface of the sheet?

A. In my opinion I do not believe there would be any difference; if so, it would be very slight.

Q. Would you consider it possible with the upper surface of the sheet at 380 or 290 degrees that the lower surface could be gotten as high as 900 or 1,000 degrees with water on it?

A. No.

Q. Have you had any tests made or are you familiar with any tests that would throw any light on that subject?

A. I have witnessed tests of boilers made by the Atlas Engine Works, with a pyrometer on different sections of their boilers, and could find no difference in temperature in the various parts. The fact is that the temperature registers approximately the same on the steam boilers.

Cross-examination.

Mr. Zettler:

Q. Did you say you made an examination of this sheet before the jury?

A. Yes.

Q. When was this examination made?

A. Monday of this week.

Q. What color was that sheet on Monday?

A. Practically the same as it is now.

Q. Did you express an opinion as to whether the crown sheet failure was due to low water or otherwise.

A. No.

281 Q. In your direct examination?

A. The substance of my opinion was that the failure was due to low water.

Q. And at the time of your examination you say that the color of the crown sheet was about the same as it is now?

A. Practically so.

Q. Do you know personally all the conditions of the explosion on engine 1902 on November 5, 1913?

A. No, sir.

(Witness excused.)

FRANK E. RUSSELL, called as a witness by the defendant, being first duly sworn, testified as follows:

Direct examination:

Mr. Dorety: I will state, in order to retain the patience of the jury and the court as much as possible, that Mr. Russell will be our last witness.

Q. What is your business?

A. Mechanical engineer. I am now chief draftsman for the Southern Pacific.

Q. Where is your place of residence?

A. In Alameda, a suburb of San Francisco, California.

Q. What has been your technical training and practical experience in connection with locomotive operation and designing?

A. I received the usual common school education and high school education, including higher mathematics and physics, etc., and after that I served two or three years—between three and four years learning the factory work, learning the factory business, during which time I studied mechanical drawing and mechanical engineering at a night school in Sacramento, California, and shortly after that I served time in the United States government, Philippine

282 Islands, as a volunteer and later as a regular on inside duties.

I returned after the war and went to work for the Southern Pacific at the Sacramento general shops in various capacities in the shops, and after putting in two years' actual time in the shop I then was changed to the drafting room or the mechanical engineering department, which department I have been in in various capacities from a beginner as draftsman up to my present position. In about 1904 I was made chief locomotive designer and in that capacity I have been ever since.

Q. Have you had some experience with button head crown bolts, with the type of crown bolts indicated as No. 3 on plaintiff's Exhibit A?

Q. I would like to examine the drawing if I may. We have had experience with the button bolts something like it and then cut off this square portion. Our practice has always been to simply use this square portion for application of the bolt only.

Q. That is for screwing the bolt in?

A. For screwing the bolt in place on the plates at the time they are applied. At the time this portion is set, after it is screwed in, this portion is cut off after it is in place. This form of bolt (ind.). I have never had any experience in that particular design. In fact

I do not consider that any of our boiler makers would apply a bolt like that in a plate because it is not properly constructed. I do not consider it as safe, as detailed on that particular drawing. There is only, presumably, three threads in that thickness of sheet. As this bolt is drawn or shown, there are only eight threads per inch, which is insufficient for bolts, and we would not consider that a good practice for a locomotive boiler, or, in fact, any other kind of a boiler.

Our practice is to have twelve threads per inch, to have a
283 sufficient number of threads to hold the bolt. Our standard bolt differs still from that that in our present practice that is a straight bolt, as it is shown, and our standard bolt has a taper or cone head which gives additional support over this smaller head or threads of the bolt.

Q. Then the bolt shown as No. 3 on Plaintiff's Exhibit A, which has been referred to in the evidence here as the Southern Pacific Bolt, is not the type of bolt used on the Southern Pacific?

A. No, sir.

Q. Do you know of any railroad on which it is used?

A. No, sir, from my experience it would not be permitted in any locomotive boiler or in any other boiler made by a boiler maker.

Q. Have you had any experience on your road with the taper head crown bolt, by that I mean a bolt with a button head?

A. Yes, sir.

Q. Are you using any or both kinds now?

A. We are using—we have both kinds in service, although our standard practice is to use what we refer to as—our standard bolt is a kind of taper threaded head.

Q. In your experience with button head crown bolts have you ever had a head, a button head, drop off or pull away or the crown sheet drop, with water on the sheet around the bolt?

A. Well, I will state in that case that — my experience I have never seen a crown sheet drop that had water on it, in my experience.

Q. With any type of bolt?

A. With any type of bolt.

Q. Have you ever heard reported any accident of that character, the dropping of the crown sheet with water on it, charged to
284 the use of button head bolts?

A. No, sir.

Q. In your opinion would it be possible to pull the head of a button head bolt with the pressure that you get in the boiler in operation and with the hottest fire that you can produce with an oil burner in operation?

A. You mean pull the head off?

Q. Yes.

A. No, sir.

Q. In your experience do the head-, because of the amount of metal in them or otherwise, become red hot with water on the sheet?

A. No, sir.

Q. Have you ever found, because of any expansion or contra-

tion in the crown sheet, or for any other reason, any scale or gas—if you know what it is—or any kind of scale or insulatory force under the head of the bolt, between the head and the crown sheet, which insulates it, and that after years of service the button head then gets red hot?

A. No, sir, I have never had any experience along that line; and, in fact, I never heard of any such theory advanced until I heard it in this court room.

Q. Are you fairly familiar with the authorities?

A. Yes, I have read all the literature I have been able to get hold of that are considered authentic and reliable in connection with locomotive boilers.

Q. Have you examined the crown sheet out of engine 1902?

A. I have examined that particular crown sheet which I was told came out of that locomotive.

Q. And which it has been testified here came out of that locomotive?

A. Yes.

Q. Have you examined the stay bolts and heads which it
285 has also been testified came out of it?

A. Yes, I have examined a number of these stay bolts and heads which were said to have come from this locomotive.

Q. From your examination what in your opinion was the cause of the explosion?

A. From my examination and from the facts in evidence on the sheet and on the bolts I came to the conclusion that it was simply a case of low water similar to a number of cases we have experienced on our line.

Q. What in your opinion was the temperature of this sheet when it gave way?

A. It is rather difficult to state just what the temperature of the sheet must have been at that time, but it is quite evident to me from the condition that the sheet now is in that the sheet must have been somewhere between a dull or just visible red heat and a bright red; in other words, it must have been red hot.

Q. Will you explain to the jury what indications on the sheet lead you to that conclusion?

A. May I step to the sheet?

The Court: You may.

A. You will notice the holes, that the sides in practically every case are stretched and in most cases elongated, and the sheet is also quilted between the stays. Now that is impossible with material of the quality that this sheet must have been to sink or elongate as it did in this particular case, or, in fact, such material as is used in boiler construction to permit of that distorting or quilting or sag between the stays. In other words, the sheet must have become red hot to permit of this sag in that shape. That is generally conceded by authorities as one of the best indications of the sheet being hot.

I believe that that is referred to particularly referred to in
286 a treatise on steam power by Wilcox, Babcock and others. If you have such a book present I think you will find that is

referred to. The color blue, of course, that is found on sheets that are dry and the temperature high—The ordinary temperature is not evident until they become red—is absent on this sheet and which it undoubtedly was in shortly after the accident. That, of course, is not evident here on account of the length of time that has elapsed between the time of the explosion and the present time.

Another thing, it would be impossible to take a piece of cold metal and stretch it until it became as this *as this* material is here at the center of the bulge without it giving visible indications of the rupture. The chances are uniform that it would crack, or part, or sever, or, if it didn't sever, the scale or skin would be rough or would be broken owing to the molecules or particles in the iron; the iron would be spread in strips parallel with the line on which it was pulled, and this is not.

Q. Is this the book to which you referred? (Handing witness book.)

Mr. Zettler: I object to that.

The Court: Sustained. Exception noted.

A. Another point that the sheet was hot is the change in the shape of these holes. If that sheet had been pulled off while it were cold—I mean at the temperature that it would naturally be with 200 pounds pressure in the boiler and the hottest oil fire that could be obtained in an oil locomotive—it would be impossible to pull those holes in that sheet off the bolts without stripping the thread. The only means by which that sheet can come off the bolts without stripping the threads would be if the sheet were hot. Then the threads on the upper side would not be stripped. You will notice the threads on one side are gone while on the other side they
287 are practically intact.

I don't know that there is anything further except the general appearance of the sheet as a whole.

Q. Will you explain how it is, if your theory is correct, that the sides and corners of the sheet failed to come down?

A. The sides and ends, in my experience, of all boilers that have failed under similar conditions, we find the sheet in better condition at all sides, especially at the corners, and generally also at the back or forward end of the sheet, which I assume to be this end here (ind.), being the forward end, the end next the flues.

Q. How do you account for that?

A. Well, there are several good reasons. One of them is the fact that, although we refer in general to a locomotive boiler, that is the water line in the locomotive boiler, we generally refer to it as a distinct and definite line, as a matter of fact it is not. If any of you have ever had any experience with a barrel of water in the box of a lumber wagon, you will understand just about what takes place in a locomotive boiler—that takes place on the road. It is quite still at first but by and by the water is surging and moving and slipping backward and forward to a considerable extent, and the portion of the crown sheet immediately ahead on the front of the

crown sheet *immediately ahead on the front of the crown sheet* by the big flue sheet adjoins the large portion of the boiler.

Q. Won't you indicate on the drawing what you refer to?

A. The big flue sheet is this sheet here, and this is the crown sheet (ind.) and this is the forward end of the crown sheet. Now, then, understand, from the forward end of the crown sheet there are vertical stays upon the sheet and in that vicinity the boiler has a considerable volume of water and a considerable length in that portion, and any direct action of the boiler will cause this
288 water to flow backwards and forwards and from one side to the other, and, owing to the cylindrical shape in the boiler, will slip and slosh about to a considerable extent. In addition to that, there is another good reason——

Q. May I ask this: Is this splashing of the water you speak of from the same cause as the water in the glass being constantly rising and falling?

A. Yes, sir, that is the indication that is generally followed. If the fireman or engineer sees the water standing still in the glass he begins to look for trouble. That is in operation, running on the road, because there are only one or two things that would cause the water to stand still. One is that he is careless in using the gauge cock and left it shut off, or, for some reason or other, the cock closed or gauge cocks have become clogged in some way. Otherwise, the water will surge backwards and forwards. If the locomotive runs into a station and the engineer places his air brakes to his train, or suddenly reverses the motion of the engine, it is a fact that with two-thirds of a glass of water, the water will then lower as much as two inches. It does not remain there but it will surge forward and back and the water will rise, so that the water is in constant motion while the locomotive is in operation.

The other reason is that in the water legs, which is the space between the outside sheets of the boiler and the side sheets of the fire box, this space is comparatively narrow, and when the locomotive is running under ordinary working conditions of a good hot fire it is producing steam very rapidly. The steam bubbles from all sides of the sheet where the water comes in contact with the sheet. The temperature of the fire is transmitted through the sheet

and induces this temperature to rise very rapidly along the
289 surface of the sheet. If the sheet is in the shape shown here the bubbles will rise vertically and come in contact with that sheet, rising very rapidly and cause considerable raising of the water line at the surface of the water. That is more noticeable on the sides, I believe, than it is on the crown sheet, for the reason that on the crown sheet the water has a tendency to get away from the fire. The same is true of the flue sheet, and it is more so on the flue sheet for the reason that considerable of the space on this flue sheet is taken up by flues, and in ordinary practice the flues are about three-fourths of an inch apart, and the steam bubbles will rise around on the flues as well as the sheet, carrying with it considerable quantities of water which, in connection with and in

conjunction with the slipping and surging of the water that is in the boiler, will throw and spread a considerable portion of water on this crown sheet or roof sheet on the parts that are adjacent to this disturbance of water in the boiler.

We made some tests in connection with that and we found in one particular case, where we placed gauge cocks where the crown sheet and side sheets came together, lying in this manner, and we found by actual test that the water would rise from $1\frac{1}{2}$ to 2 inches in the gauge cock placed in that particular location, higher than on the crown sheet when the engine was running, provided the engine was heavily fired and the safety valves allowed to pop, which would represent to some extent what takes place when the engine is working steam.

These two reasons are reasons that I have given from the study I have made of explosions we have had where the same questions have come up as to why the flue sheet didn't show signs of so much sheet as the crown and side sheets, and that was the reason and conclusion I reached in connection with it.

290 Q. Then your experience and tests indicate that by reason of the water rising with the steam, as you have outlined, and the flow of water back from the cylindrical portion of the boiler, there is likely to be water on the higher edge of the sheet?

A. Yes, that would still reach water and that would cool that sheet and maintain a considerably less temperature, especially at the corners where you get double steam action more than at the center of the sheet.

Q. How does that theory work out in practice? What do you find as conditions on other explosions being similar to this, as to the front end and corners?

A. Practically the same. We have found in several cases, a case in particular recently that I have had opportunity to examine that was very similar, although the explosions were very much more severe than this particular case—They were not quite so fortunate—although the flue sheet and side sheets were a very distinct blue almost half way down the side sheets, I found the flue sheet overheated only about two flues down, while there was positive evidence that the water was far below that on the side, and the color line and the heat line were more definite in both cases.

Q. What has your experience been with fusible plugs?

A. We have had fusible plugs in boilers on the Southern Pacific ever since I have been employed by the Southern Pacific Co.

Q. Do you know of any other railroad that uses them?

A. I have known of some other roads that have used them, and I have known of other roads that have discontinued the use of them. I cannot say whether there are any roads using them in present practice or not.

Q. Do you find that they invariably let loose or melt when the water is low and invariably keep tight and hold the water when there is plenty of water above?

291 Mr. Zettler: I object to that.
The Court: Overruled. Exception.

Q. Answer the question.

A. Our experience with the fusible plug, I would state, has been far from satisfactory. We find at times that they let go when there is an abundance of water on the sheet, and we have had occasion recently, had two occasions in less than a year, where a boiler blew down a crown sheet causing a very disastrous explosion and the fusible plug had not fused. The fusible plug was removed and we tested it in the presence of the Federal boiler inspectors and it fused within ten degrees of the point that we make the fusible plugs to fuse at, that is about 540 degrees temperature Fahrenheit.

Q. And it would not work in actual practice?

A. It did not in that case. And in another case we had a boiler where the water was allowed to become low, the crown sheet blew out. That particular boiler was equipped with two fusible plugs, at two different places. Both of them fused but didn't save the explosion. Very unfortunately, both men were killed and no one knows whether or not they knew anything about it, but the chances are they did not.

Mr. Zettler: I object to the witness stating what the chances were.

The Court: That will be granted and the jury instructed not to consider it. Exception.

Q. In your opinion does the use of fusible plugs tend to eliminate accidents?

A. No, sir.

Q. Have you seen explosions on oil-burning locomotives where your taper head crown bolt—not the button head but the other one—was used and where the crown sheet had one or more fusible plugs, and, if so, how did it compare in violence with
292 this one?

A. Yes, sir, we have had two cases. In both cases the explosions were very much more severe and violent than in this case. I photographed the boilers in detail in both cases and I have the photographs with me.

Q. Won't you produce them?

A. If you will permit me to get the package. Here is a set of photographs taken from one of our Mallett Locomotives. This engine was equipped with two fusible plugs, both of which fused, but the boiler exploded.

(By Mr. Zettler:)

Q. May I ask if you took these pictures yourself?

A. Yes, there are the original negatives.

Q. You know these were equipped with fusible plugs?

A. Yes, I examined them personally.

Q. And that engine had the riveted heat bolt and not the button head?

A. Yes, the taper head.

Mr. Dorety: I would like to offer these in evidence, Defendant's Exhibits 12 to 18.

Mr. Zettler: No objection.

The Court: They may be received.

A. This engine, as I said, was equipped with two fusible plugs and they both fused, and they were located in two different locations in the crown sheet. I might state that as to the nature or violence of the explosion in this particular case, that is the Mallett locomotive, 401,000, around the drivers, the force of the explosion was sufficient to lift that boiler off, tearing it off from the other machinery, turning it over in the air, and throwing it back over the tender, and down over a refrigerator car, striking a rail and skidding off and landing so as to clear the right of way. The reason why it passed over the tender, in this particular class of engine, the engine is automatically cut loose, that is the engine runs ahead. We do that to save the crew.

Q. The whole boiler turned a summersault through the air?

A. Tore it away from the line of the train, threw it over in the air at least once, and cleared the tank and came down over a refrigerator car in the same train, setting the train on fire.

(By Mr. Zettler:)

Q. In all these cases was it not a fact that the crown sheets were torn?

A. In both cases the explosions were so severe, the explosions were so great, it tore up the crown sheet.

Q. The other photographs which I will offer you show what conditions?

A. The other photographs, the small set which I handed you, were taken from a consolidation locomotive of our standard type which failed.

Q. How was that equipped as to crown bolts?

A. We had our standard S. P. bolt on that with the taper screw head riveted over, and it had a fusible plug applied. I will show approximately the position on the sheet so they will understand it. Below from this boiler it was what was at the highest point on the crown sheet. In other words it was placed between this bolt and this bolt, between the second and third rows. The stays support the crown sheet between these two. The engine in question was equipped similarly on this date; that fusible plug didn't fuse. The plug is composed of eight parts lead and one part tin which should fuse at approximately 540 degrees Fahrenheit. We removed the plug in the presence of the Federal boiler inspectors, and then had it tested and the metal fused within 10 degrees of the same point required. I don't recall whether it was 10 degrees over or under; it only varied a few degrees.

Q. The photographs which you referred to are those I hold
294 in my hand numbered 19 to 27, inclusive, offered by defendant?

A. Yes.

Mr. Dorety: I will offer them in evidence.

Mr. Zettler: No objection.

The Court: They may be received.

Q. What water conditions do you have on your system as compared with ours?

A. Well, I might say that we have practically all kinds. I think some of the best and some of the worst. We have every bad water conditions on most of our lines. On the Sierra Nevadas we have what we consider as the best about of any division of the Coast Range, but through the southern part of the state adjacent to the Coast Range the water is hard and very poor in many places. We treat it in many places and even with the treatment we have a great deal of trouble.

Q. Have you had any experience with scale?

A. Yes, some considerable experience.

Q. What is the effect of a piece of scale, 50 square inches say, on the crown sheet, would it be perceptible from the fire box side?

A. Do you mean would it?

Q. Would it be perceptible from looking at the sheet?

A. Could it be determined?

Q. From an inspection that the scale was there?

A. No, it couldn't be determined from an inspection from the fire side that the scale was on the upper side; if it was of considerable thickness, if it had attained any considerable thickness, it would be plainly visible; the scale would not be visible but its effects would be visible.

Q. What would its effects be?

A. It would be what we commonly call a mud burn. In other words, the sheet would be bagged or sagged in the location
295 where the scale had accumulated. Scale requires considerable time to form; it does not come at any one time. It is the residue from the water evaporating; it forms gradually and is continually increasing.

Q. Do you mean under any conditions?

A. It depends a good deal on the water. Thus, in a bad water district the scale is continually forming as long as the engine is working, but possibly it would not form—It would have to be very bad to form over 1/64 of an inch in one day; it would have to be extremely bad water.

Q. What has been your experience with the mountain water? Do you have trouble with scale there?

A. On our mountain water in the Sierra Nevada mountains, as I said heretofore, we have the very best water, what we consider the best, but what is regularly called the Coast Range of mountains it is a lime stone formation and you will invariably find bad water.

Q. In this water do you have scale trouble?

A. No, sir, no scale trouble at all. In fact in some places we do not have enough scale there to protect the flue sheet, corrosion due to pure water.

Cross-examination.

Mr. Zettler:

Q. Do you know of your own personal knowledge as to the actual facts of this explosion on this 1902 on November 5, 1913?

A. I know of no facts other than the sheet and the bolts that have been shown me.

Q. You don't know anything about the actual facts of the accident at that time?

A. No, sir.

Q. What you are giving as to how it occurred is your opinion?

I ask you if that is your opinion? Answer that Yes or No.

296 A. Yes, sir.

Q. Now you spoke on your direct examination of standard bolt head on your oil-burning engine as being a taper head, is that correct?

A. That is what we consider our standard bolt.

Q. Would you kindly come down to the drawing and indicate with your pencil practically the head that you use?

A. As compared with this?

Q. Yes, and draw it of actual size.

A. Is it improper to draw it on this sheet?

A. No, mark it right on there. Put the actual size.

A. It is very roughly indicated. (Witness complied with request.)

Q. It is immaterial about the threads; we care nothing about that.

A. Roughly, that is approximately it. It is about an inch and one eighth in its diameter. At this particular point here it is about a quarter on the first sheet. It is largest on the inside. One-eighth more on one side than on the other.

Q. On that kind of button head it is nearer the—I mean just the head itself—that indicated by Figure 3 or Figure 1? It is nearer 3 than 1?

A. It is nearer 3 than 1.

Q. That is the only button head used in oil-burning on your road?

A. It is what we call our standard bolt, but it is not entirely or altogether.

Q. That is what you call your standard?

A. Yes, that is what we call our standard.

Q. With whom did you go over your testimony in regard to your theory that you have explained to the jury, before the trial?

A. With no one.

Q. Not with Mr. Dorey?

A. No, sir.

297 Q. He knew nothing about what you were going to testify to?

A. He asked me some questions and I answered him.

Q. He knew nothing at all about what you were going to testify to?

A. No, sir.

Redirect:

Q. Do you find that what you call your standard bolt has any advantage as to safety over the button head?

A. As to safety I don't believe it has any advantage whatever.

Q. What advantage has it, if any?

A. It is a more economical bolt.

Q. Aside from being cheaper has it any advantage——

A. I don't believe it has any advantage.

Q. Are you familiar with tests which have been made as to the temperature of the two sides of the crown sheet and temperature in the fire box?

A. I have read considerable literature along those lines.

Q. From what study you have made of that subject what would you give as the temperature in the fire box in an oil-burning locomotive and the temperature on both sides of the crown sheet?

A. I consider the temperature of an oil-burning fire box of a locomotive would range probably under ordinary working conditions, from 2,000 degrees as a minimum up to possibly 2,500 degrees, or thereabouts, as a maximum; and as to the difference in temperature between the top side or the water side and the fire side of the sheet, I consider that under the most extreme conditions the locomotive boiler is under, as there is water over the sheet, I do not believe it would amount to more than possibly between 50 and 70 degrees. I think 75 or possibly 100. I will say that 100 would be an extreme maximum. I think I could give a little further proof to bear out this particular fact, that is the fact of the super-

298 heated flues—the device on the locomotive which extends to within 24 inches of the top sheet in a locomotive, and those flues or device have absolutely nothing in them further than the steam as it is raised or spread above the sheet temperature of the steam, which is 387.8. We have a number of locomotives for some time under those conditions and this device didn't burn much. It would seem very clear to me that the only steam being able to reduce the temperature or keep the temperature down to that extent that that was over the sheet, the difference in temperature must be always negligible.

Q. From your experience is there any foundation to the theory advanced by Mr. McGrath and Mr. McCabe that the lower side of the crown sheet gets 500 or 600 degrees hotter than the upper side, causing rocking of the bolt and causing an opening between the head of the bolt and sheet when it is heated causing insulation to form in there which would tend to burn the bolt off?

A. I don't believe it is possible under any conditions for sufficient insulation, due to gas or other substance, to form underneath the head of the crown bolt of sufficient thickness to cause any material effects, because if that was true it would simply mean that we could not operate a locomotive boiler.

Q. Have you ever been called upon to defend a law suit on account of your button head oil burning locomotives?

A. No, sir.

Q. Have you ever heard such a theory advanced by any authority of standing or experience in boiler construction other than Mr. McGrath and Mr. McCabe?

Mr. Zettler: I object to the form of the question on the ground it is dealing in personalities. That question might be asked very properly if necessary.

The Court: I think the question is improper in form. Exception.

299 Q. I will put it this way: Before you came into the court room in this trial did you ever hear such a theory advanced by any reputable authority on engine construction?

A. No, sir, I never heard the theory advanced before I heard it in this court room.

Recross:

Q. There are new theories coming up every day? You don't know all the theories that are advanced?

A. No, it would be impossible for a man to get all the theories that are advanced.

Q. Now, will you kindly come down here so that the jury may understand you?

A. (Witness steps down to drawing.)

Q. As I understand, your testimony is that the standard head that you use in oil-burning engines on your road is as indicated by you in pencil on Figure 3 of Plaintiff's Exhibit A, approximately?

A. It is as near as I can represent it. That (ind.) represents the portion of the sheet. In other words, it is a taper head, having twelve threads per inch, riveted over. The rivet over is not a fixed part of it; it is used for screwing it on and is cut off after it is riveted through. It might come out considerably further or it might not; that is a matter as it happens to come.

Q. And you said, did you not, that the amount of material in your crown bolt head is nearer the amount of material in 3 than in 1, as indicated here?

A. Yes, more nearly the amount of material in 3 than in 1, as represented here. This is the first time I have even seen any bolt with this square head.

Q. Now, as indicated on 1, that shows the same thing as indicated on Figure 3, with the same size?

300 A. I don't know whether that is or not; that is approximately it. Some of them might be in evidence. That indicates some considerable thickness.

Q. Is that what you call the button?

A. No, we call it a screw set.

Q. Would you kindly indicate with your pencil by marking it 4 and the dotted line to it. Just indicate that with a 4.

A. (Witness indicates on drawing.)

(By Mr. Dorety:)

Q. That is to represent the same thing as in No. 3?

Mr. Zettler: As to material.

(Witness excused.)

Defendant rests.

Mr. Zettler: It is stipulated that owing to the fact that there are two No. 4's, I may change the Figure 4 which the last witness said represented the standard type of crown bolt head used on the Southern Pacific lines on oil-burners to No. 5, so that the Figure 5 on Exhibit A of plaintiff represents what the last witness for the defendant said represented the standard type of heads in oil-burning engines on his road, that being in lead pencil, that line being the Southern Pacific.

The Court: That may be done.

301 JAMES McCABE, called as a witness by the plaintiff, in rebuttal, having been previously sworn, testified as follows?

Direct examination.

Mr. Zettler:

Q. In your experience, Mr. McCabe, have you become familiar, are you familiar with the discoloration of crown sheets caused by low water?

A. I am.

Q. What discoloration is produced?

A. If the crown sheet is overheated it has a deep blue color.

Q. I will now ask you if you had any experience, as to how long that deep blue color will remain? Just answer if you have had any experience.

A. I have.

Q. What would you say then, assuming that the crown sheet before you had failed because of low water and that it had attained a deep blue color, such as you say, the accident occurring on November 5, 1913, as to whether such color would forever be observable on the crown sheet if that crown sheet had not been used after the accident?

A. It would.

Q. Do you observe such a color now?

A. I do not.

No cross-examination.

(Witness excused.)

302 THOMAS HANSON, called as a witness by the plaintiff, in rebuttal, having been previously sworn, testified as follows:

Direct examination.

Mr. Zettler:

Q. You were present, Mr. Hanson, in this court room when one of the officers of the Great Northern, Mr. Brady, testified in regard to your making a statement the day after the accident, were you not present?

A. I was.

Q. The claim agent—You were present when the claim agent said it?

A. I was.

Q. Gave that testimony?

A. I was.

Q. You didn't sign any such statement, did you?

A. I did not.

Q. How severely were you burned?

A. To such an extent that I was in a very critical condition for about two or three weeks.

Q. What was your condition as to being under the influence of morphine while you were in the hospital, during the first part of it?

Mr. Dorey: I object as not proper rebuttal. They went into this in the original examination.

The Court: I think the condition of the witness was inquired into. Exception.

Q. Do you remember of testifying that Mr. Brady visited you?

A. I do.

Q. What happened at the first visit?

Mr. Dorey: That was also gone into in their case in chief. I recall his inquiring about that.

The Court: He may answer this question. Exception noted.

303 Q. The first time that Mr. Brady came up what happened?

A. We visited for a few moments. He inquired into my condition, smoked a cigar and visited about half an hour, and I believe he left some cigars on the stand and left.

Q. And the next visit that Mr. Brady, the official of the Great Northern, made, do you remember that conversation?

A. I do.

Q. Just tell the jury the purport of that conversation was, in regard to what you told him, what the conversation was?

Mr. Dorey: He stated that already once.

The Court: I will permit the witness to answer, but I do not want to go all over this case again. Exception.

A. Mr. Brady came in the second time and he made the remark that he was after information that trip and asked me if I was willing to give him information in regard to the accident. I told him I

was willing to give him all the information I possessed. He said Mr. Kelly sent an order wanting him to get a statement from me as to the amount of water there was in the boiler at the time of the accident, and I told him there was at least two inches of water on that curve, because I looked at the water glass not more than thirty seconds before the accident occurred.

Q. And, as you testified, is it a fact that 2 inches of water in the water glass is equivalent to 4 or 5 inches in a curve?

A. Yes.

Q. Did you make any statement to him that the water was lower than usual according to the grade?

A. I did not.

Q. Did you make a statement to him at any time that the water was dead in the glass?

A. I did not.

304 Cross-examination.

Mr. Dorety:

Q. Did you hear me read the statement in full to the jury purporting to have been your statement?

A. The one the claim agent read.

Q. This one giving the exact history, the minute you left the various stations and how many minutes you stayed at the various stations, and where you took water and all the facts, of the journey?

A. I heard the claim agent read the statement yesterday morning.

Q. It was I who read the statement.

A. Yes.

Q. Were the facts substantially correct?

A. I believe they were according to the reports that came out afterwards.

Q. At the time Mr. Chemidlin got the information you were in a condition to give fairly accurate information on those details?

A. If Mr. Chemidlin got such a statement from me he did it without my knowledge.

(Witness excused.)

Plaintiff Rests.

Defendant Rests.

The Court: The time for argument is fixed at one hour per side. The plaintiff may divide their time as they see fit.

(Adjournment taken until to-morrow morning at 9:30.)

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June 18, 1914, Morning Session.

In the Superior Court of the State of Washington in and for the
County of Snohomish.

No. 13831.

ADALINE DONALDSON, as Administratrix of the Estate of Vance H.
Thoms, Deceased, Plaintiff,

vs.

GREAT NORTHERN RAILWAY COMPANY, a Corporation, Defendant.

Instructions.

Instruction No. 1.

Members of the Jury:

You are instructed that this is a civil action where the plaintiff seeks to recover damages on account of the death of one Vance H. Thoms, under and pursuant to the provisions of what is known as the Federal Employers' Liability Act and its amendments.

The pleadings in this case consist of the amended complaint, the answer of defendant thereto and the reply of the plaintiff to the answer. These pleadings you will be permitted to take with you to the jury room, but the same shall not be deemed evidence of any fact in issue. You will also be permitted to take with you to the jury room any exhibits which have been received in evidence, and these shall be given such weight and effect by you in arriving at your verdict as you shall deem them respectively entitled to receive.

Admittedly, Vance H. Thoms, while in the employ of the defendant, on the 5th day of November, 1913, as an engineer engaged in operating defendant's engine No. 1902, and engaged in duties pertaining to interstate commerce, was fatally injured by the explosion of the boiler of said engine, said injuries directly resulting in the death of Vance H. Thoms on the 5th day of November, 1913.

In addition to certain denials contained in defendant's
306 answer the defendant has pleaded two so-called affirmative defenses one of which alleges that the explosion was contributed to by the negligence and want of care of said Vance H. Thoms in that he had allowed the water in the boiler of the locomotive to become too low, thus allowing the crown sheet confining said water to become overheated, thereby causing the explosion of said engine; and the other that the explosion of the engine was caused by risks or hazards which were incident to the occupation in which said Vance H. Thoms was then and there engaged, and that those risks and hazards and any negligence of the defendant were known to and assumed by said Vance H. Thoms at and prior to the time of the explosion.

Instruction No. 2.

You are instructed that a railway company is not an insurer of the lives or the safety of its employes, and the mere fact that an employe is injured in the performance of his work will not of itself alone make the company liable for his injuries.

Instruction No. 3.

You are instructed that you cannot find for the plaintiff in this action if you believe from the evidence in the case that the injuries to and death of Vance H. Thoms *was* caused by the sole negligence of the said Vance H. Thoms himself and that there was no negligence on the part of the defendant or any of its employes other than said Vance H. Thoms.

Therefore, if you find that the explosion upon the locomotive engine No. 1902 would not have occurred if there had been a proper supply of water in the boiler and that the explosion was due to the fact that the supply of water in the boiler had been diminished until there was not sufficient left to protect the crown sheet of the boiler from the heat of the fire box and the bolts holding such crown sheet in place from such heat, and that the said Vance H. Thoms by the exercise of reasonable care could have discovered such short-
307 age in the supply of water and could have extinguished the fire or otherwise prevented the explosion, and that he was in charge of the engine and the water supply at the time, then the defendant would not have been liable for the injuries and your verdict must be for the defendant in this case.

Instruction No. 4.

Even if you should find that there were certain defects in the boiler of the locomotive upon which Vance H. Thoms was injured, or even if you should find that there were faults in the construction of said boiler or that the defendant company had been negligent in failing to adopt a proper type of boiler or in failing to properly inspect the boiler, still, none of these faults would make the defendant company liable in this action unless you should find that such fault or defect was the cause of the explosion, or that the explosion would not have happened if it had not been for such fault or defect.

Instruction No. 5.

The plaintiff alleges that the death of Vance H. Thoms was directly caused by the negligence of the defendant railroad company in that the locomotive boiler of the engine on which the explosion took place was negligently allowed to be defective in the following particulars:

1. That the button heads of the crown bolts were excessively large; and

2. That the boiler was not provided with safety fusible plugs;
and
3. That scale was negligently allowed by the defendant to accumulate on the crown sheet of the said boiler.

If you find from the evidence that the defendant was negligent in any one or more of these particulars, and that said negligence was the direct cause of the death of Vance H. Thoms then
308 the plaintiff is entitled to recover a verdict at your hands in such sum as you shall determine in accordance with these instructions, not exceeding in any case the sum of \$20,000.00, unless you shall find that Vance H. Thoms assumed the risk of the explosion as hereinafter explained.

Instruction No. VI.

You are instructed that the law provides that it shall be unlawful for any common carrier, as was the defendant, engaged in interstate commerce, to use any locomotive engine propelled by steam power unless the boiler of the locomotive engine and appurtenances thereof are in proper condition and safe to operate in the service to which the same is put, that the same may be employed in the active service of said carrier in moving traffic, without unnecessary peril to life and limb; and that no employe shall be deemed to have assumed any risk of death by reason of any locomotive engine operated in violation of said law, and that no employe injured or killed by reason of a locomotive engine operated in violation of said law shall be held to have been guilty of contributory negligence.

Therefore, if you shall believe from a fair preponderance of all the evidence in the case that the boiler of the locomotive engine No. 1902 or the appurtenances thereof were not in proper condition and safe to operate in the active service of the defendant in moving traffic without unnecessary peril to life or limb by reason of the negligence of the defendant in any one or more of the three respects alleged in the complaint, then and in that case Vance H. Thoms assumed no risk of death and was guilty of no contributory negligence, and the affirmative defenses must fail.

However, if such boiler and appurtenances were in proper condition and safe for such use in moving traffic, but due to defendant's negligence were defective in one or more of the respects alleged in the complaint and Vance H. Thoms had actual
309 knowledge of such defect or defects, or such defects were so plainly observable that in the reasonable exercise of his faculties he should have known of such and may be presumed to have known thereof and the dangers that surrounded him, then Vance H. Thoms assumed the risks of injury and the plaintiff cannot recover in this action.

So, also if such boiler and appurtenances were in proper condition and safe for such use in moving traffic but due to defendant's negligence were defective in one or more of the respects alleged, Vance H. Thoms would have been guilty of contributory negligence if he failed to exercise such care and prudence as an ordinary and prudent

and careful person engaged in like employment under like circumstances would usually and ordinarily exercise, with the legal effect and result set forth in the following instructions.

Instruction No. VII.

You are further instructed that under the law which governs this case, even though you should find that Vance H. Thoms was guilty of contributory negligence and did not himself use due care, this fact alone would not necessarily prevent the plaintiff from recovering a verdict at your hands if the defendant was negligent in one or more of the respects alleged.

In other words, even though Vance H. Thoms did not himself use due care, such is not of itself a complete bar to plaintiff's recovery if the fair preponderance of the evidence establishes that the defendant was guilty of negligence in any one or more of the three manners alleged, and that such negligence directly caused the death of Thoms; but in that case the contributory negligence of Vance H. Thoms, if any, must be allowed by you to have the effect of reducing the damages, if any, found by you to have been sustained by plaintiff
310 in the proportion which his—Thom's—contributory negligence bears to the combined negligence of himself and the defendant, if you shall find that defendant was negligent.

Instruction No. VIII.

The burden rests upon the plaintiff to establish that the defendant was negligent in one or more of the respects alleged in the complaint, and the burden is upon the defendant to establish that the deceased, Vance H. Thoms, was guilty of contributory negligence, or assumed the risk of injury.

The burden of proof in this action means the obligation and duty to produce that evidence which preponderates in favor of the one party or the other, as the case may be.

Instruction No. IX.

You are instructed that if you find for the plaintiff in this case, that she is entitled to recover such damages as you may deem from the evidence to be a fair and just compensation for whatever pecuniary loss, if any, a fair preponderance of the evidence shows her to have sustained by reason of her son's death, in no case exceeding the amount claimed in the amended complaint. If you find for the plaintiff, in assessing her damages you are to take into consideration and determine the loss of pecuniary benefits which Mrs. Donaldson might, under the evidence, have reasonably received if Vance H. Thoms had not been killed; but you must not make any allowance for any grief and mental anguish or sorrow which the plaintiff may have suffered at the loss of her son or for the loss of his companionship. The only elements of damage for which you can allow compensation are such material and pecuniary advantages, if any, as you believe from a fair preponderance of the evidence the

plaintiff would have received from her son for her own use had he continued to live.

311 In this connection it is not necessary that Vance H. Thoms should have been under any legal liability or duty to give the plaintiff pecuniary assistance or support. It is sufficient that the evidence shows that there was some reasonable expectation of pecuniary assistance or support of the plaintiff by Vance H. Thoms of which she has been deprived.

Instruction No. X.

You are further instructed that you are to disregard any statement of counsel made in argument or during the progress of the trial which is not borne out by the evidence, and are to disregard all testimony which may have been stricken out by the court and must not consider as evidence any question or the answer thereto to which the court has sustained any objection. It is improper for the court to comment on the evidence or to in any manner indicate its opinion as to what the evidence establishes or tends to establish, or as to the truth or falsity of the testimony of any witness whomsoever; and any inference which you may have drawn as to the court's opinion upon any fact in controversy during the progress of the trial or from anything the court has said in ruling upon any question presented, or otherwise, must be absolutely disregarded by you.

Instruction No. XI.

In determining the facts in this case you should weigh the evidence in both sides carefully and determine each fact according to the preponderance of the evidence bearing upon the fact. You should not permit yourselves to be influenced in the slightest degree or at all by any feeling of sympathy for the plaintiff for her deceased son, nor should you allow yourselves to be influenced in any manner by the fact that the defendant is a railroad corporation. You should lay aside any feelings you may have of sympathy for or prejudice against either one of the parties to this case, and make an honest and conscientious effort to determine each fact according to the preponderance of the evidence and to return a verdict according
312 to such facts and the instructions of the court.

In arriving at your verdict in this action you should be guided in matters of law entirely by these instructions, even though you should consider some of these rules of law improper, harsh or unjust to one party or the other. It is your duty to lay aside your personal feelings and personal opinions in the matter and accept and follow these instructions as a proper statement of the law.

Instruction No. XII.

You are instructed that a fair preponderance of the evidence means the greater weight or probative value or convincing effect of the evidence, and does not necessarily depend upon the greater number of witnesses sworn on the one side or the other. You are at liberty

as jurors to consider all the facts and circumstances appearing from the evidence in the case and determine from all those facts and circumstances which way the evidence preponderates on any question in dispute.

You are the sole and exclusive judges of the credibility of the witnesses and the weight and effect to be given to the testimony of each one, both for the plaintiff and for the defendant.

In weighing the testimony of the various witnesses, it is your duty to determine whose testimony is most worthy of belief from the appearance and demeanor of the respective witnesses; their manner of testifying; their apparent frankness or lack of frankness, if any; their bias or prejudice for or against either party, if any; their apparent intelligence or lack of it; their interest in the result of the case if any; their respective opportunities to become acquainted with the facts concerning which they have testified; and all surrounding circumstances, and give credit accordingly.

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Instruction XIII.

You are further instructed that upon retiring to the jury room you will elect one of your number foreman, and when any ten of you have agreed upon a verdict the foreman will sign and date the same and indicate to the bailiff that the jury has agreed but shall not tell the bailiff or any other person until the verdict is read in open court what the verdict is.

If you shall find for the plaintiff, then the form of your verdict will be:

"We, the jury duly impaneled and sworn in the above entitled cause, do find for the plaintiff, and do fix the amount of her recovery herein at — Dollars."

(Inserting the amount.)

If you shall find for the defendant, then the form of your verdict shall be:

"We, the jury, duly impaneled and sworn in the above entitled cause, do find for the defendant."

Forms of these verdicts will be prepared by the court and handed to you by the bailiff.

Endorsed, Filed June 18, 1914. W. F. Martin, County Clerk.

Once on the first day of the trial (during the introduction of evidence), and once again during the argument to the jury, the plaintiff, Mrs. Donaldson, apparently lost control of herself and burst into hysterical weeping and moaning and cried out several times, "My boy, my boy." Her friends were apparently unable to comfort her and each time immediately removed her from the court room to an outer room, where she remained, the last time, until the jury had retired to consider their verdict.

After the close of all of the evidence and the instructions
314 by the court, Mr. McCabe made the opening argument to the jury on behalf of the plaintiff. He argued that there must have been plenty of water on the crown sheet at the time of the ex-

plosion for the reason that if the water had been low there would be a permanent blue discoloration on the crown sheet and that no such discoloration was now apparent. He stated other reasons for concluding that there must have been plenty of water upon the crown sheet at the time of the explosion and for concluding that the bolt heads holding the crown sheet in place were defective, by except as above stated, did not make any reference to the testimony of the witness Thomas Hanson to the effect that there was water in the water glass at the time of the explosion and during the entire trip from Skykomish up to point where the explosion occurred and that there was plenty of water in the boiler and upon the crown sheet at the time of the explosion. During the same argument he stated to the jury that a brakeman in the employ of the defendant had been in the cab of the locomotive, the explosion of which forms the subject matter of this action, not more than thirty seconds before the explosion took place and that said brakeman could tell whether or not there was water in the water glass at that time. And Mr. McCabe in said argument further commented to the jury of the fact that said brakeman was not called as a witness. Mr. McCabe further stated in said argument that one Sherman Corrigan, a trainmaster in the employ of the defendant and a witness in this action, had picked up a large number of buttonheads from the crown bolts of said engine and Mr. McCabe then and there commented on the fact that said buttonheads were not produced in evidence. No objection nor request that the jury be instructed to disregard these arguments was made during Mr. McCabe's argument.

Mr. Dorety, of the attorneys for the defendant, made the closing argument on behalf of the defendant. He argued that it appeared from many indications that there must have been a lack of water in the boiler and upon the crown sheet of engine 1902 at the time of said explosion but except as above stated, did not refer in any way to the aforesaid testimony of the witness Thomas Hanson.

On the morning of the second day of the trial Mr. Dorety had twice called for plaintiff's witness Mr. Pierron for further cross-examination and said witness did not respond. During his argument Mr. Dorety stated to the jury that on the first day of the trial he had asked Mr. Pierron to test certain bolt heads in Mr. McCabe's possession with a hammer and chisel and to report the result of his tests to the jury, and that when Mr. Dorety had called for the witness on the second day of the trial he did not respond, and Mr. Dorety commented on this failure to respond, by saying that he had disappeared.

Mr. Zettler, of the attorneys for the plaintiff, made the closing argument to the jury on behalf of the plaintiff. During this argument Mr. Zettler stated that all of the defendant's evidence as to whether or not there was sufficient water upon the crown sheet at the time of the explosion was opinion evidence and that the only witness who actually knew whether or not there was water there was the witness Thomas Hanson, who had testified that there was plenty of water in the glass and upon the crown sheet at the time. A large portion of Mr. Zettler's argument was devoted to this subject. Mr.

Dorety objected to this as new argument unless defendant should be given an opportunity to reply to the same. Court overruled this objection and refused to give the defendant an opportunity for reply.

During Mr. Zettler's closing argument he stated to the jury that Mr. Dorety's argument regarding the failure of the witness Pierron to respond for further cross-examination and that he had disappeared on the second day of the trial was unfair, for the reason that counsel for plaintiff had stated to Mr. Dorety that the witness Pierron could and would be produced for further cross-examination if Mr. Dorety desired it and that Mr. Dorety had stated that he did not desire to cross-examine him further. Mr. Dorety took the following exception:—at the time of the making of these statements in argument.

"I want an exception to counsel's testifying to the facts in this matter and ask the court that the jury be instructed to disregard it unless I be permitted to testify in return."

The Court: Neither side will be permitted to testify any more in this case. The jury have been instructed to disregard any statements of counsel not borne out by the evidence and of which they are the sole judges, that they are the sole judges of the facts in this case which must be determined from the evidence and that alone, and I expect the jury to follow that instruction and that counsel will bear in mind that statement of the law.

Mr. Dorety: I would like to have an exception to counsel making a statement of what is not in evidence.

The Court: You may have an exception.

Mr. Dorety: I want to make it clear that I want time to reply to that portion of counsel's argument not brought out in the original argument bearing upon Hanson's testimony. I ask for five minutes' time for that.

The Court: That application will be denied. The argument made by counsel relative to the testimony of Hanson I deem perfectly proper rebuttal argument. Exception.

Jury retired in charge of the bailiff who was sworn.

Final formal judgment was signed by the court on the third day of August, 1914, upon application of plaintiff's attorneys, form of same having been submitted by plaintiff's attorneys.

318 In the Superior Court of the State of Washington in and for the County of Snohomish.

No. 13831.

ADALINE DONALDSON, as Administratrix of the Estate of Vance H. Thomas, Deceased, Plaintiff,

vs.

GREAT NORTHERN RAILWAY COMPANY, a Corporation, Defendant.

Certificate.

STATE OF WASHINGTON,

County of Snohomish, ss:

I, Ralph C. Bell, one of the judges of the superior court of the state of Washington, in and for the county of Snohomish, and sitting in Department No. 1 of said court, and the judge before whom the above entitled cause was tried, do hereby certify:

That the matters and proceedings embodied in the foregoing statement of facts are matters and proceedings occurring in said cause, and the same are hereby made a part of the record therein.

I do further certify that the same contains all the material facts, matters and proceedings heretofore occurring in said cause and not already a part of the record therein, except exhibits, and motions which were filed in support of, or opposition to, the motion for new trial.

I do further certify that the foregoing statement of facts contains all of the evidence and testimony introduced upon the trial of said cause, except said exhibits, together with all objections and exceptions made and taken to the admission or exclusion of testimony, and all motions, offers to prove and admissions and rulings thereon.

I do further certify that the papers and photographs forwarded herewith and marked respectively Plaintiff's Exhibit "A" and Defendant's Exhibits "1", "9", "11" and "12" to "27" inclusive, are exhibits offered and received in evidence upon said trial; and that articles forwarded herewith and marked respectively defendant's

319 Exhibits "2" to "8" inclusive and "10" are exhibits offered and received in evidence upon said trial which by reason of their bulk cannot be attached to this statement of facts; that each of the exhibits above referred to is the exhibit referred to in the foregoing transcript of evidence by the number marked upon it as aforesaid, and each of said exhibits is hereby made a part of the record herein.

I do further certify that the copies of affidavits attached hereto are copies of affidavits duly filed in this action in support of or in opposition to the motion for a new trial filed and argued herein, and that copies of all such affidavits on file herein are attached hereto and are hereby made a part of the record herein.

Done in open court this 27th day of October, 1914.

RALPH C. BELL,

*Judge of the Superior Court of the State of Washington,
in and for the County of Snohomish.*

320 In the Superior Court of the State of Washington for Snohomish County.

No. 13831.

ADALINE DONALDSON, as Administratrix of the Estate of Vance H. Thomas, Deceased, Plaintiff,

vs.

GREAT NORTHERN RAILWAY COMPANY, a Corporation, Defendant.

Affidavit in Support of Motion for New Trial.

STATE OF WASHINGTON,

County of King, ss:

F. G. Dorey being duly sworn on oath deposes and says: That he is one of the attorneys for the defendant in the above entitled action and that he represented the defendant in said action upon the trial thereof; that he heard all of the evidence in said action and believes that the verdict of the jury is contrary to the overwhelming weight of the evidence and unsupported by any evidence and that it was the result of sympathy, passion and prejudice and not of a fair consideration of the evidence.

That during the introduction of evidence, and again during the argument, the plaintiff, Mrs. Donaldson, broke forth in apparently hysterical weeping and moaning and cried out several times, "My boy, my boy." That her friends were apparently unable to comfort her and removed her from the court room and outer room where she continued to moan to such an extent as to be audible to the jury and that affiant believes and alleges that the sympathies and passion of the jury were thereby aroused to such an extent that they were unable to give a fair and impartial consideration of the evidence in the case.

That during the examination of J. J. Dowling as a witness on behalf of defendant, counsel for plaintiff held certain typewritten sheets of paper before him and read, or pretended to read therefrom certain statements to the effect that the explosion which caused the death of the plaintiff's decedent in this action was not caused by low water as contended by defendant, but that the same was
321 caused by improper crown bolts used by defendant and that counsel for plaintiff then asked the witness whether, if such statements were a part of the report of the United States Boiler Inspectors who examined said engine after the explosion, he would believe them, or whether it would change his mind; that counsel for plaintiff repeated several questions incorporating, or pretending to incorporate, extracts from such a report and also asked the witness a similar question with reference to a statement, or purported statement, of the chief engineer of the American Locomotive Works, to the effect that buttonhead crown bolts of the type used by the Great Northern Railway Company were improper; that affiant is not in-

formed as to whether said extracts were actually a part of any report of said Federal Boiler Inspectors or a part of any letter from the Chief Engineer of the American Locomotive Works, or not; that if they were not actually a part of such report or letter, affiant alleges that counsel read them for the purpose of conveying to the jury the impression that such a report had actually been made, and such a letter actually written; that if it is a fact that said extracts were actually taken from such a report and letter, affiant alleges that the same were not properly admissible as evidence in this action and that this fact was known to counsel for plaintiff and that counsel for plaintiff read said extracts for the sole purpose of informing the jury as to the contents of said report and letter, the same not being properly admissible in evidence; that counsel for plaintiff had no certification and no means of properly proving either said letter or said report if the same had been admissible, and never had any expectation or intention, or belief, that he could follow up said questions with any competent or legal proof in support of the same; that affiant believes and alleges the fact to be, that counsel for plaintiff asked said questions knowing the same to be objectionable and for the sole purpose of compelling counsel for defendant to object to the same, thereby creating the impression in the minds of the jury that such a report was disadvantageous to defendant and that defendant would be unwilling to have them hear the same, or in the hope that counsel

322 for defendant would be deterred by these considerations from objecting to such questions and the contents of said report would thereby become known to the jury; that the extracts or purported extracts from said report were highly prejudicial to the defendant; that affiant has had nine years' experience in trial work in the state of Washington and nearly six years as attorney for the Great Northern Railway Company, engaged in the trial of jury cases, and has frequently discussed a verdict and the reasons controlling the same with members of juries who have been discharged from further service, and that affiant has thereby become, and is, familiar with the considerations which frequently control the juries in the return of their verdict and that it is the opinion of affiant that it would be prejudicial to defendant to object to questions such as those asked by counsel for plaintiff and that the jury would necessarily draw the deduction that the report was disadvantageous and that defendant was afraid to have it read; and it is further the opinion of affiant that the mere reading of a purported extract from such a report produces in the minds of the jury the impression that such extracts are genuine; that affiant believes and alleges the fact to be that the aforesaid conduct of counsel for plaintiff was misconduct highly prejudicial to defendant and that the same influenced the jury in the determination of their verdict.

That after counsel for defendant objected to the form of cross-examination being pursued by counsel for plaintiff aforesaid, and suggested in support of said objection that the genuineness of said report could not be properly proven in this case, counsel for plaintiff requested affiant in open court and in the presence of the jury, to

consent to the producing of said report, knowing that the production of the same was forbidden by United States statute; that affiant believes and alleges that counsel for plaintiff did not then have, and has never had, any properly certified copy of any such report to produce even if the same had been admissible and that said request was made of counsel for defendant for the sole purpose of giving the jury the impression that defendant did not wish said report to be produced.

That counsel for plaintiff thereupon called as a witness one James McCabe, and questioned him as to whether or not the document
323 from which counsel for plaintiff had been reading extracts in asking said questions, was not a report which he had received from the Interstate Commerce Commission or Chief Boiler Inspector of the United States in reply to his request for a report on said explosion; that counsel for plaintiff knew when he called said witness and when he asked said questions, that the said report was inadmissible and that if the same had been admissible, it could not be properly proven by said witness or by said questions, and that said witness was called, and said question asked, for the sole purpose of strengthening the minds of the jury in the impression already created, by counsel's cross-examination, that the report of the Federal inspectors on said explosion was adverse to the defendant and that defendant was unwilling to have the same produced and for the purpose of compelling counsel for defendant to object to said questions and to thereby create in the minds of the jury the impression that said report would be disadvantageous to defendant.

That during the closing argument by counsel for plaintiff, and when counsel for affiant had no further opportunity to reply thereto, counsel for plaintiff made the statement to the jury that affiant had stated in his opening statement to the jury that plaintiff might produce the report of the Federal inspectors on the said explosion if they cared to do so; that in truth and in fact, affiant never made any such statement in his opening statement to the jury or at any other time; that affiant did say to the jury in his opening statement that no accident had ever been known to occur from the use of buttonhead crown bolts and that there was no case on record where the use of fusible plugs had prevented an explosion, while there were cases where explosions had occurred with fusible plugs being used, and affiant then added the statement that if such cases had existed the plaintiff could get information about them from the United States reports, since all such accidents were reported to the United States Government; but affiant made no statement that plaintiff could, or that affiant would consent to such reports themselves being introduced in evidence in this case and that affiant
324 made no reference whatever at any time during the progress of this action to any report covering the explosion involved in this action, and that the said statement made by counsel for plaintiff in his closing argument was untrue and made for the purpose of misleading the jury.

That on the first day of the trial affiant requested one Peron

a witness for plaintiff, to make certain tests on the heads of crown bolts recovered from the explosion involved in this action and to report regarding the same the next morning; that on the following morning affiant twice called for the said witness Peron and he was not in the court room and that affiant commented upon this fact in his argument to the jury; that thereafter, and in his closing argument, to which affiant had no opportunity of replying, counsel for plaintiff stated to the jury that the reason said Peron was not in the court room was that he, counsel for plaintiff, had asked affiant if Peron would be required and that affiant had answered no. That in truth, and in fact, no such question was asked of affiant until after the plaintiff's case was rested and the cross-examination of his witnesses closed and that affiant did not then state to counsel for plaintiff that he had not wished to recall said witness but that affiant simply made the statement that he had wished to cross-examine him further as a part of plaintiff's case and that affiant supposed it was now too late to do that inasmuch as defendant's case was then being put on; that affiant did not excuse said Peron or consent to his absence at any time until after the defendant was presenting its case in chief and that affiant did in fact twice call for said witness for further cross-examination and that the statement made by counsel for plaintiff to the jury was misleading and made for the purpose of giving the jury the impression that the testimony of said Peron would be unfavorable to the defendant and that defendant was unwilling to recall him.

That affiant believes and alleges that the verdict of the jury was not supported by any competent evidence and that the preponderance of the evidence was overwhelmingly in favor of the defendant and that the jury did not, and could not, base their verdict upon any evidence of fault or responsibility on the part of the
 325 defendant but that the jury were influenced by sympathy for the plaintiff and prejudice against the defendant fostered and encouraged by the aforesaid acts of the plaintiff herself and by the aforesaid misconduct of plaintiff's attorneys.

Affiant further alleges that the closing argument of the plaintiff's attorneys was based largely on the testimony of one Hanson, who had testified that there was water in the waterglass just prior to the explosion, indicating that there was sufficient water in the boiler and that the explosion must have been due to some defect in the locomotive; that this argument and this testimony had not been suggested or referred to in any way or touched upon in the opening argument of plaintiff's attorney, and that affiant had therefore had no opportunity to reply to the same, and affiant believes and alleges that it was improper for plaintiff's counsel to bring up in closing new arguments which had not been referred to in opening and to which affiant had no opportunity of replying; that affiant requested permission of the court to reply to said argument but that the same was refused.

F. G. DORETY.

Signed, subscribed and sworn to before me this 24th day of June, 1914.

L. M. KNOX,
*Notary Public in and for the State of
Washington, Residing in Seattle.*

326 In the Superior Court of the State of Washington in and for
Snohomish County.

No. 13831.

ADALINE DONALDSON, as Administratrix of the Estate of V. H.
Thoms, Deceased, Plaintiff,

VS.

GREAT NORTHERN RAILWAY COMPANY, a Corporation, Defendant.

Affidavit of R. W. Mitchell.

STATE OF WASHINGTON.

County of King, ss:

R. W. Mitchell being duly sworn, on oath deposes and says: That he is now and at all times herein mentioned has been employed as a fireman by the Great Northern Railway Company. That he is acquainted with Mrs. Adaline Donaldson, the plaintiff in the above action, and was acquainted with Vance H. Thoms, her son, who was killed as a result of the explosion of Great Northern Engine 1902. That up to a few weeks preceding the death of said Vance H. Thoms Mrs. Donaldson had lived at Interlay, in Seattle, and that up to the time of her moving to Gold Bar, and for approximately three months preceding that time, affiant had roomed at Mrs. Donaldson's home and had taken some meals there, paying thirty-five cents a meal and five dollars a month for the room, the total expense averaging twelve or fourteen dollars per month. That during a part of said time affiant was firing an engine between Leavenworth and Seattle, while the said Vance H. Thoms was running an engine out of Leavenworth. That said Thoms sent contributions to his mother on every pay day, and that on the occasion of two monthly pay days affiant was requested by said Thoms to take said payments to his mother, and did so; that on one occasion the amount taken was forty dollars and on the other occasion fifty dollars. That affiant never carried any other sums personally, but for all that affiant knows said Thoms may have sent or taken other contributions in other ways.

327 That affiant has never been questioned concerning the above matters until this date, and has never before given any information concerning them to any one connected with the claim or legal departments of the Great Northern Railway Company.

R. W. MITCHELL.

Subscribed and sworn to before me this 26th day of June, 1914.

L. M. KNOX,
*Notary Public in and for the State of
Washington, Residing at Seattle.*

328 In the Superior Court of the State of Washington for Snohomish County.

No. 13831.

ADALINE DONALDSON, as Administratrix of the Estate of V. H. Thoms, Deceased, Plaintiff,

vs.

GREAT NORTHERN RAILWAY COMPANY, a Corporation, Defendant.

Affidavit of Frank Cassidy.

STATE OF WASHINGTON,
County of King, ss:

Frank Cassidy being duly sworn on oath deposes and says: That he is, and for nearly four years last past, has been employed as a locomotive fireman by the Great Northern Railway Company, the defendant in the above action; that he is acquainted with Mrs. Adaline Donaldson, the above named plaintiff, and was acquainted with her son Vance H. Thoms, prior to his death, that he rented a room and made his home with Mrs. Donaldson and her said son from about June, 1911 to May, 1913, with the exception of four or five months: that during said time, affiant paid Mrs. Donaldson five dollars (\$5.00) a month for room rent and approximately nine dollars (\$9.00) a month on an average for meals which he took at her home; that during all but the first three or four months of that time there were other men rooming and boarding with Mrs. Donaldson and during about half of that time there were five men beside said Vance H. Thoms boarding and lodging with Mrs. Donaldson, and during the balance of the time two or three men; that all of said men took a portion of their meals with Mrs. Donaldson for which they paid at the rate of thirty-five cents (35c) a meal as affiant is informed and believes and affiant is unable to state just how many meals they took but that it is his opinion that their payments would average about the same per month as affiant's payments, which were about fourteen dollars (\$14.00) including room and board. Affiant has never given any of the foregoing information to any one connected with the claim department or legal department of the

329 Great Northern Railway Company and has never been questioned concerning the same until this date and did not know that the above action had been set for trial or that any of the above information might be in any way material in said trial.

FRANK A. CASSIDY.

Subscribed and sworn to before me this 25th day of June, 1914.

MILTON W. MOORE.

*Notary Public in and for the State of
Washington, Residing in Seattle.*

330 In the Superior Court of the State of Washington for Snohomish County.

No. 13831.

ADALINE DONALDSON, as Administratrix of the Estate of F. H. Thoms, Deceased, Plaintiff,

vs.

GREAT NORTHERN RAILWAY COMPANY, a Corporation, Defendant.

Affidavit of William Lavigne.

STATE OF WASHINGTON,

County of King, ss:

William Lavigne being duly sworn on oath deposes and says: That he is, and for more than four years last past, has been employed as a locomotive fireman by the Great Northern Railway Company; that for a period of five or six months he was boarding and rooming with Mrs. Adaline Donaldson, the plaintiff in the above action, at 3231 15th Avenue, Seattle, in the fall of 1912, and spring of 1913; that during said time he paid Mrs. Donaldson an average of from twelve to fifteen dollars per month for a room and portion of his meals; that affiant paid at the rate of thirty-five cents (35¢) per meal for his meals but was away a large portion of the time; that during said time there were from two to three men boarding and rooming with Mrs. Donaldson under similar arrangements and paying in the opinion of affiant about the same amount per month as affiant did; that during all of said time, Sim Donaldson, a half-brother of said V. H. Thoms and son of Mrs. Donaldson, was making his home with Mrs. Donaldson and had his wife there during a portion of said time; that said Sim Donaldson was employed by the Great Northern Railway Company as a switchman at that time. Affiant has never given any of the foregoing information to any one connected with the claim department or legal department of the Great Northern Railway Company and has never been questioned concerning the same until this date and did not know that the above action had been set for trial or that any of the above information might be in any way material in said trial.

WILLIAM LAVIGNE.

331 Subscribed and sworn to before me this 25th day of June, 1914.

MILTON W. MOORE,

*Notary Public in and for the State of
Washington, Residing in Seattle.*

332 In the Superior Court of the State of Washington in and for
Snohomish County.

No. 13831.

ADALINE DONALDSON, as Administratrix of the Estate of V. H.
Thoms, Deceased, Plaintiff,

vs.

GREAT NORTHERN RAILWAY COMPANY, a Corporation, Defendant.

Affidavit of H. E. Burton.

STATE OF WASHINGTON,
County of King, ss:

H. E. Burton being duly sworn on oath deposes and says: That he is, and was at all times herein mentioned, in the employ of the Great Northern Railway Company and was a conductor on the East-bound train on which Vance H. Thoms was one of the engineers on November 5, 1912, at the time of the explosion of Engine 1902, which resulted later in the death of said Vance H. Thoms; that on the following morning affiant called at the Providence Hospital in Everett to see Thomas Hanson, the fireman who was on said engine with said Vance H. Thoms, that affiant asked said Hanson if the water in said engine had been low at the time of the explosion and said Hanson replied that there was about half a glass of water but that the water in the glass had appeared stationary just before the explosion and that said Hanson had asked engineer Thoms to try the gauge cocks and that just about that time the explosion occurred; that said Hanson appeared to be entirely rational at the time of said conversation with affiant; that affiant has never given the above information to any one connected with the claim department or legal department of the Great Northern Railway Company until this date.

H. E. BURTON.

Subscribed and sworn to before me this 26th day of June, 1914.

L. M. KNOX,

*Notary Public in and for the State of Washington,
Residing in Seattle.*

333 In the Superior Court of the State of Washington for
Snohomish County.

No. 13831.

ADALINE DONALDSON, as Administratrix of the Estate of V. H.
Thoms, Deceased, Plaintiff,

vs.

GREAT NORTHERN RAILWAY COMPANY, a Corporation, Defendant.

Affidavit of F. G. Dorety.

STATE OF WASHINGTON,

County of King, ss.

F. G. Dorety being duly sworn on oath deposes and says: That he is one of the attorneys for the defendant in the above entitled action and has had entire charge of the said action and of the preparation of the same for trial on behalf of the defendant; that within a few days after the commencement of said action affiant caused investigations to be made by W. S. Chemidlin, Traveling Claim Agent for defendant, covering the issues raised by the complainant in said action and including the financial arrangements existing between the plaintiff and her son, now deceased, prior to his death; that at about the same time, affiant advised James McCabe, one of the attorneys for plaintiff, that affiant intended to file a motion to make the complaint more definite and certain or for a bill of particulars setting forth the manner and extent to which said deceased had contributed to the support of the plaintiff prior to his death unless plaintiff would furnish said information voluntarily, and that said McCabe in reply advised affiant that plaintiff had been living with her son at Gold Bar prior to his death and that he had not paid her stated sums, but that he had been her sole support; that affiant thereupon instructed said W. S. Chemidlin to make inquiries at Gold Bar concerning said matters and affiant is informed and believes that said Chemidlin did make said inquiries of various persons at Gold Bar as shown by his affidavit filed herewith; that affiant did not know until after the trial of this action that plaintiff had lived in

334 Seattle until shortly before the time of the accident and affiant is informed by said Chemidlin and believes, that he did not know of such fact, and for that reason, defendant did not have any inquiries made prior to the trial of this action among the neighbors of plaintiff or other persons living at Seattle concerning said issues; that affiant first learned that plaintiff had resided in Seattle until shortly before the death of her son after the trial by chance from a former neighbor; that affiant thereupon secured the former address of plaintiff from neighbors and caused inquiries to be made as to what railroad men had boarded at that address and in that manner, and not otherwise, secured the information contained in the affidavits of Mr. Cassidy, Mr. Mitchell and Mr. Lavigne, filed herewith; that none of said information was known to affiant until

two days preceding the date of this affidavit, but that affiant had understood and supposed that plaintiff had lived at Gold Bar for a considerable time prior to the death of her son and that she had been entirely supported by him during such time; that plaintiff testified upon the trial of this action that said son had been her only means of support prior to his death; that affiant believes that the fact that plaintiff had earned a considerable income keeping a boarding house up to within a few weeks of the death of her son and that she was therefore qualified to operate a boarding house and might probably do so again are all material facts which can be established upon a second trial of said action and which would materially diminish any verdict which plaintiff might receive, and that the jury in the present action would not have returned so large a verdict if they had known said facts and the same is true of the fact that R. W. Mitchell was the messenger who carried contributions from said Thoms to plaintiff for two months shortly preceding his death and that said contributions on pay day at least amounted to only forty and fifty dollars respectively; that the fact that plaintiff has another son living, is a material fact which is inconsistent with plaintiff's statement in evidence that she had no other means of support, and that said fact if known to the jury would, in the opinion of the affiant, have materially reduced the verdict, and that said fact was unknown to affiant and affiant had no means of discovering the same until after the trial of this action.

335 That affiant secured a statement from H. E. Burton concerning said accident soon after the same occurred and that said H. E. Burton then and there out of sympathy for plaintiff and her deceased son withheld from affiant the fact that he had conversed with Thomas Hanson after the accident regarding the cause thereof, and that affiant did not learn until after the trial of said action that said Hanson had stated to said Burton that the water in the water glass was stationary just preceding the explosion.

That in the opinion of affiant, all of the evidence set forth in the affidavits filed herewith is material evidence and that if the same had been known to affiant prior to the trial of said action, affiant would have produced the same at said trial; that each of the men who have signed an affidavit, filed herewith, has stated to affiant that the facts therein stated are true and that he will testify to the same in this action, and affiant is informed and believes that all of said facts are true; that they could not have been produced at the former trial of this action; and that they are material and that a just verdict cannot be had unless said facts are made known to the jury.

F. G. DORETY.

Subscribed and sworn to before me this 26th day of June, 1914.

L. M. KNOX,

Notary Public in and for the State of Washington.

Residing at Seattle.

336 In the Superior Court of the State of Washington in and for
Snohomish County.

No. 13831.

ADALINE DONALDSON, as Administratrix of the Estate of V. H.
Thoms, Deceased, Plaintiff,

VS.

GREAT NORTHERN RAILWAY COMPANY, a Corporation, Defendant.

Affidavit of W. S. Chemidlin.

STATE OF WASHINGTON,
County of King, ss:

W. S. Chemidlin being duly sworn on oath deposes and says: That he is, and was at all times herein mentioned, employed as Traveling Claim Agent by the Great Northern Railway Company, and that as such Traveling Claim Agent it was his duty to make an investigation of the facts involved in the above entitled action and that he did make such investigation immediately after the accident, and also after the commencement after said action; that after the commencement of said action he was instructed by F. G. Dorety, attorney for said defendant, to make inquiries at Gold Bar as to the family and pecuniary arrangements between the plaintiff and her deceased son Vance H. Thoms and that affiant did make such inquiries of various people, among others, to the best of affiant's recollection, the roundhouse foreman and station agent of the Great Northern Railway Company, at Gold Bar, both of whom were acquainted with Vance H. Thoms, and that affiant was advised that said Thoms had been making his home with his mother prior to his death at Gold Bar, and that so far as said informants knew, plaintiff had no other means of support; that affiant was not informed then or at any other time prior to the trial of this action and did not know that plaintiff had been living in Seattle shortly prior to the death of the said Thoms and therefore made no inquiries in Seattle that affiant was not informed and did not know that plaintiff ever kept boarders or lodgers.

W. S. CHEMIDLIN.

Subscribed and sworn to before me this 26th day of June, 1914.

L. M. KNOX,

*Notary Public in and for the State of Washington,
Residing at Seattle.*

337

Legal Dept., G. N. Ry. Co.

Received Jun- 26, 1914, Seattle, Wash.

In the Superior Court of the State of Washington in and for the
County of Snohomish.

No. —.

ADALINE DONALDSON, as Administratrix of the Estate of Vance H.
Thoms, Deceased, Plaintiff,

vs.

GREAT NORTHERN RAILWAY COMPANY, a Corporation, Defendant.

Affidavit.

STATE OF WASHINGTON,

County of King, ss:

Hyman Zettler and James McCabe, being first duly sworn on oath, each for himself says: That they are attorneys for the plaintiff in the above entitled action, and as such tried the case for her; that while it is true that plaintiff lost control of herself for a very brief time twice during the long trial, it was caused mainly by the fact that defendant placed and maintained in the court room during the entire trial a large black box—purporting, we believe, to represent a locomotive boiler—but which black box was never used in the trial at all—that such black box was suggestive of a coffin and was largely responsible for plaintiff's acts; that none of her actions were at all intentional but that she was immediately removed from the court room, out of the hearing of the jury; that during the argument when she was taken out, she was kept out, and entirely away from the hearing of the jury during the entire remainder of the case; that affiants believe that if plaintiff's actions had any effect on the jury, it was adverse to her; that no objection was made by defendant, nor did it make any application to the court to instruct the jury to disregard this.

Referring to that portion of Mr. Dorety's affidavit beginning at the bottom of page 1 and extending to the middle of page 5, affiants

338 *sat* that the written opinion of the chief engineer of the American Locomotive Works and the report of the Federal Boiler Inspector referred to by Mr. Dorety were exactly what they were purported to be—actual and true statements of the chief engineer of the American Locomotive Works and of the Federal Boiler Inspection Department as received from them; that they were not in any manner whatsoever fictitious as Mr. Dorety insinuates—that Mr. Dorety in his opening statement did state to the jury in effect that such a Federal report was in existence, was printed and published by the United States government and could be produced by the plaintiff in court, thereby leading the jury to believe that if plaintiff did not produce said report it was unfavorable to her; that

immediately upon the very first objection of counsel for defendant showing that he intended to prevent plaintiff from using said report, affiants immediately ceased all reference whatsoever to said report;—that affiants' actions in this connection were entirely bona fide and occasioned by Mr. Dorety's opening statement.

Referring to the last paragraph on page 4 of Mr. Dorety's affidavit, affiants say that any reference to the Federal report in counsel's closing argument to jury was caused by Mr. Dorety's statement in his address of the jury, accusing counsel for plaintiff with unfair tactics in respect to said report, and that no reference at all to said report would have been made, had not Mr. Dorety unfairly made such accusation in his argument to the jury.

Referring to the last part of page 5 and the first part of page 6 of Mr. Dorety's affidavit in regard to Mr. Pierron, affiants say that Mr. Dorety, on Tuesday morning June 16, 1914, the second day of the trial, did call for said witness—that shortly before one-thirty o'clock of the same day affiant McCabe, in the absence of the jury, notified Mr. Dorety that Mr. Pierron could and would be produced in court for further cross-examination by Mr. Dorety if Mr. Dorety so desired; that Mr. Dorety in the presence of both affiants, and not in the presence or hearing of the jury, then said that he did not need

Mr. Pierron any more and that Mr. Pierron could be allowed
339 to go home; that defendant made no application to the court

requiring Mr. Pierron's attendance; that any reference to Mr. Pierron's absence made by plaintiff's counsel during the latter part of the closing argument was the actual facts and was caused solely by Mr. Dorety's unfair statement to the jury in his argument to the effect that Mr. Pierron had "disappeared," leading the jury to believe to the contrary of the actual facts; that the court at that time specifically instructed the jury to disregard all statements of counsel not borne out by the evidence received during the trial.

Referring to the last paragraph of Mr. Dorety's affidavit in regard to the argument of plaintiff's counsel in regard to Mr. Hanson's testimony, affiants state that the opening argument for plaintiff and the answering argument for defendant dwelt largely with whether the explosion was caused by low water and that plaintiff's counsel's reply argument called attention to the fact that Mr. Hanson's testimony tended to show that there was no low water.

HYMAN ZETTLER,
JAMES McCABE.

Subscribed and sworn to before me this 24th day of June, 1914.

WILLIAM E. FROUDE,
*Notary Public in and for the State of
Washington, Residing at Seattle.*

34C

Legal Dept., G. N. Ry. Co.

Received Jun- 29, 1914, Seattle, Wash.

In the Superior Court of the State of Washington in and for the
County of Snohomish.

No. 13831.

ADALINE DONALDSON, as Administratrix of the Estate of Vance H.
Thoms, Deceased, Plaintiff,

vs.

GREAT NORTHERN RAILWAY COMPANY, a Corporation, Defendant.

Affidavit of Mrs. Adaline Donaldson.

STATE OF WASHINGTON,

County of King, ss:

Mrs. Adaline Donaldson, being first duly sworn, on oath says: That I am the plaintiff in the above entitled action; that I have read the affidavits of Frank Cassidy, William Lavigne, R. W. Mitchell, W. S. Chemidlin and F. G. Dorety, submitted by defendant in support of its motion for a new trial; that while it is true that I kept some boarders during the early part of the year 1913, I derived no profit from this, the cost of keeping the boarders more than exceeding the amounts charged the boarders; that I, therefore, some time before the death of Vance Thoms, gave this up permanently and had no intention of ever keeping boarders in the future, owing to Vance Thoms' request and to my lack of physical strength, and no profit; that this fact of having kept boarders in no way affected the fact that Vance Thoms was practically my sole support—my other son, Sim, not having contributed; in fact Vance helped support Sim.

That all of these facts would have been brought out on my examination at the trial had I been asked; that it is true that I lived in Seattle with Vance Thoms prior to moving to Gold Bar, but this fact was at all times well known to the defendant, as Vance worked for the defendant out of Seattle during this time, the records of defendant company showing Vance's exact place of residence,

MRS. ADALINE DONALDSON.

Subscribed and sworn to before me this 29th day of June, 1914.

HYMAN ZETTLER.

*Notary Public in and for the State of
Washington, Residing at Seattle.*

342 In the Superior Court of the State of Washington for Snohomish County.

No. 13831.

ADALINE DONALDSON, as Administratrix of the Estate of Vance H. Thoms, Deceased, Plaintiff,

vs.

GREAT NORTHERN RAILWAY COMPANY, a Corporation, Defendant.

Affidavit of James McCabe.

STATE OF WASHINGTON,

County of King, ss:

James McCabe, being first duly sworn, on oath says: That I am one of the attorneys for the plaintiff in this action; that in regard to the defendant's not knowing of the prior residence of Vance Thoms and plaintiff, the records of defendant company at all times showed the actual residence of Vance Thoms and the fact that he previously resided in Seattle, and counsel for defendant with the exercise of any care at all could have ascertained this and all other of their purported "newly discovered evidence" from the records and employes of the defendant itself.

Referring to Mr. Dorety's affidavit (verified June 26, 1914) in regard to a conversation between Mr. Dorety and myself, affiant states that he told Mr. Dorety only the actual facts and did not answer Mr. Dorety's questions in any way untruthfully or misleading; that affiant told Mr. Dorety at that time that Vance Thoms contributed on the average of about seventy-five to eighty dollars per month towards Mrs. Donaldson's support.

JAMES McCABE.

Subscribed and sworn to before me this 29th day of June, 1914

HYMAN ZETTLER,

*Notary Public in and for the State of
Washington, Residing at Seattle.*

343 In the Superior Court of the State of Washington for
Snohomish County.

No. 13831.

ADALINE DONALDSON, as Administratrix of the Estate of V. H.
Thoms, Deceased, Plaintiff,

vs.

GREAT NORTHERN RAILWAY COMPANY, a Corporation, Defendant.

Affidavit of F. G. Dorety.

STATE OF WASHINGTON,
County of King, ss:

F. G. Dorety being duly sworn on oath deposes and says: That he is one of the attorneys for the defendant in the above action and the same F. G. Dorety who made original affidavits in support of motion for a new trial herein; that it is true as alleged in the affidavit of Hyman Zettler and James McCabe that defendant had present in court a representation or model of a section of a locomotive boiler, same being between two and three feet square and not over three feet in any one direction, open at both ends and crossed in both directions by a large number of round sticks representing iron bolts; that said box was neither the shape nor size of a coffin and had no resemblance whatever to one beyond the fact that it was black; that it was prepared in anticipation that certain testimony might be offered by plaintiff which was not in fact offered, and for no other purposes whatever.

Referring to statements on page 2 of said affidavit, affiant again denies that he made any statement either in his opening statement or at any other time to the effect that a federal report on this action was in existence or was printed or published, or that it could be produced by plaintiff in court, and affiant denies that he made any reference whatever to such report or to any federal report except as stated in his original affidavits.

Referring to statements on the middle of page 3 in said affidavit, affiant denies that he made any statement to James McCabe
344 except as stated in affiant's original affidavit, and alleges that plaintiff's case had been completed about the middle of the morning on the date in question and long before 1:30 in the afternoon when the conversation with said McCabe is alleged to have occurred, and that the only statement affiant made to McCabe at that time was, he had wished to cross-examine Pierron but that he supposed it was now too late.

Affiant further alleges in addition to acts of misconduct of plaintiff's counsel already set forth in his original affidavits that James McCabe, Esq., one of plaintiff's counsel, during his opening argument to the jury at the close of the case, stated to the jury that a brakeman in the employ of the defendant had been in the cab of

the locomotive, which had exploded, not more than thirty seconds before the explosion and could tell whether or not there was water in the water-glass and said McCabe further commented to the jury on the fact that said brakeman was not called as a witness; and said James McCabe in said argument further stated to the jury that one Sherman Corrigan a trainmaster in the employ of the defendant and a witness in this action, had a large number of buttonheads from the crown bolts of the engine which exploded, and said McCabe then and there commented on the fact that said buttonheads were not produced in evidence; that there was no testimony and no evidence whatever in the record to support either of said statements and affidavit is informed and believes, and so alleges, that both of said statements were and are untrue and were calculated to, and did, mislead and prejudice the jury against this defendant.

F. G. DORETY.

Subscribed and sworn to before me this 9th day of July, 1914.

HYMAN ZETTLER,

*Notary Public in and for the State of
Washington, Residing at Seattle.*

345

No. 1 EXHIBIT.

Offered in Evidence for Identification by Defendant in Case No.
13831.

12500.

191—

EVERETT, WASH., November 6, 1913.

My name is Thomas Hanson and I am employed by the Great Northern Railway Company as fireman. I was fireman on Ex. East No. — Conductor Burton, from Gold Bar to Leavenworth on November 5, 1913. We had two helper engines No. 1902, Engineer V. H. Thoms, myself as fireman, and Engine 1920, Engineer Thomas. Our engine No. 1902 was in the middle of the train. I could not say how many cars we had but we left Gold Bar at about 4:15 a. m. but were called for 1:50 a. m. We took water when we left Gold Bar, which was at about 1:20 a. m. and we arrived at Skykomish at 6:20 a. m. We also took water at Reiter at about 4:45 a. m. and when we got to Skykomish we had about a foot of water in the tank. The boiler was full of water. We were at Skykomish about 45 minutes and about 20 minutes before leaving Skykomish we took water and we then had about a foot of water in tank. The boiler was full and we had about 200 pounds of steam on at the time. Everything was working all right on engine but there were some stay bolts on boiler leaking on both sides of firebox. Engineer Thoms and myself had made the trip with engine 1902 from Leavenworth on November 4 and the stay bolts were leaking then. I told Engineer Thoms and I think he reported it, although

I am not sure. This would naturally cause a loss of water in boiler but not enough to amount to anything. When we left Skykomish at about 7:40 a. m. I looked to see if we had enough water. This was after we had taken water at Skykomish and when we started from Skykomish we had a full tank of water and the water glass in cab of engine showed about $\frac{3}{4}$ full. Engineer Thoms had asked me if the tank was full before leaving Skykomish so I went back to look. We had gone about six miles from Skykomish and 346 during that time I kept watch of amount of water in boiler and while I was looking at water glass to see how much water we had the glass showed about two inches and at this time the explosion took place. I had asked engineer to try the gauge cocks as the water in glass appeared to be standing still and I think Engineer Thoms was doing so when accident took place. The water in glass standing still would indicate that glass was stopped up and as glass showed two inches of water I could not say whether we had any less or not as engineer did not have time to try gauge cocks.

I was standing up near firebox at time looking at water glass and Engineer Thoms had just rose to try gauge cocks. We were running about 6 miles an hour at the time. I have been firing on this engine about 4 months, and about 2 months ago the side sheet on right side cracked and same was patched at Gold Bar or Everett. The side sheet was cracked at right hand side of cab.

The trip from Leavenworth on November 4 was the first time I had been on this engine for a month. I do not know what caused accident.

Statement was read to Fireman Thomas Hanson and he said same was correct. He could not sign same on account of injured hands.

Witnesses:

Miss LENA JACOBS.

Indorsed: Filed Jun- 18, 1914. W. E. Martin, County Clerk.

347 In the Superior Court of the State of Washington in and for the County of Snohomish,

No. 13831.

ADALINE DONALDSON, as Administratrix of the Estate of Vance H. Thoms, Deceased, Plaintiff,

vs.

GREAT NORTHERN RAILWAY COMPANY, a Corporation, Defendant.

Verdict.

We, the jury, duly impaneled and sworn in the above entitled cause, do find for the plaintiff, and do fix the amount of her recovery herein at \$8,500 *Dollars* (Inserting the Amount).

Dated this 18 day of June, 1914.

JAMES A. ELLEFSON, *Foreman*.

Filed June 18, 1914. W. F. Martin, County Clerk.

348 In the Superior Court of the State of Washington in and
for the County of Snohomish.

No. 13831.

ADALINE DONALDSON, Administratrix of the Estate of Vance
Thoms, Deceased, Plaintiff,

vs.

GREAT NORTHERN RAILWAY COMPANY, a Corporation, Defendant.

Motion for Judgment Notwithstanding Verdict.

Now comes the defendant above named and moves the Court for an Order vacating the verdict heretofore made by the Jury herein and for judgement in favor of the defendant and against the plaintiff.

This motion is based upon the ground, that the evidence introduced on behalf of plaintiff and all the evidence in the case was insufficient to justify a verdict in favor of the plaintiff, in that it failed to show any negligence on the part of the defendant and showed without dispute that the injuries to plaintiff were all due to the sole negligence of Vance Thoms, deceased.

This Motion is based upon the records and files herein and upon the reporters' notes of the testimony introduced at the trial of said action.

F. V. BROWN,

F. G. DORETY,

Attorneys for Defendant.

Filed Jun- 20, 1914. W. F. Martin, County Clerk.

349 In the Superior Court of the State of Washington in and
for Snohomish County.

No. 13831.

ADALINE DONALDSON, as Administratrix of the Estate of Vance H.
Thoms, Deceased, Plaintiff,

vs.

GREAT NORTHERN RAILWAY COMPANY, a Corporation, Defendant.

*Notice of Filing Motion for Judgment, Notwithstanding the Verdict,
and for New Trial.*

To the Plaintiff above named and to Messrs. James McCabe and
Higgins & Hughes, her attorneys:

You, and each of you, will please take notice that the defendant
above named has this day filed in the office of the Clerk of the Su-

perior Court of Snohomish County, Washington, its motion for judgment notwithstanding the verdict in the above action, and its motion, in the event that said motion for judgment be denied, for an order vacating the verdict heretofore rendered therein, and ordering a new trial in said action, copies of which each of said motions bearing the file mark of the clerk of said court are herewith served upon you.

Dated, Seattle, Washington, June 20th, 1914.

F. V. BROWN,
F. G. DORETY,
Attorneys for Defendant.

We hereby acknowledge service of copies of the above mentioned motion and of a copy of the foregoing notice.

HIGGINS & HUGHES,
JAMES McCABE,
Attorneys for Plaintiff.

Filed Jun- 23, 1914. W. F. Martin, County Clerk.

350 In the Superior Court of the State of Washington in and for the County of Snohomish,

No. 13831.

ADALINE DONALDSON, Administratrix of the Estate of Vance Thoms, Deceased, Plaintiff,
vs.

GREAT NORTHERN RAILWAY COMPANY, a Corporation, Defendant.

Alternative Motion for New Trial.

Comes now the defendant above named and moves that in the event that the Motion for Judgment notwithstanding the Verdict, filed herein shall be denied, the Court enter an Order vacating the verdict of the Jury heretofore entered herein and granting a new trial in the above entitled action for the following causes materially affecting the substantial rights of the defendant.

1.

Irregularities in the proceeding of the adverse party and of the Court and Orders of the Court and abuse of discretion by which the defendant was prevented from having a fair trial.

2.

Mis-conduct of the prevailing party and her attorneys.

3.

Newly discovered evidence material for the party making the complaint which it could not with reasonable diligence have discovered and produced at the trial.

4.

Excessive damages appearing to have been given under the influence of passion and prejudice.

5.

Insufficiency of the evidence to justify the verdict or the decision; That the same is against law.

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6.

Error in law occurring at the trial and excepted to at the time by the party making the Complaint.

This Motion is based upon the records and files herein and upon the affidavits which will be filed in support of this Motion and upon the reporter's notes of the testimony and proceedings of said action.

F. V. BROWN,
F. G. DORETY,
Attorneys for Defendant.

Filed Jun- 20, 1914. W. F. Martin, County Clerk.

352 In the Superior Court of the State of Washington for
Snohomish County.

No. 13831.

ADALINE DONALDSON, as Administratrix of the Estate of Vance H.
Thoms, Deceased, Plaintiff,

vs.

GREAT NORTHERN RAILWAY COMPANY, a Corporation, Defendant.

Affidavit in Support of Motion for New Trial.

STATE OF WASHINGTON,

County of King, ss:

F. G. Dorety being duly sworn on oath deposes and says: That he is one of the attorneys for the defendant in the above entitled action and that he represented the defendant in said action upon the trial thereof; that he heard all of the evidence in said action and believes that the verdict of the jury is contrary to the overwhelming weight of the evidence and unsupported by any evidence and that it was the result of sympathy, passion and prejudice and not of a fair consideration of the evidence.

That during the introduction of evidence, and again during the argument, the plaintiff, Mrs. Donaldson, broke forth in apparently hysterical weeping and moaning and cried out several times, "My boy, my boy." That her friends were apparently unable to comfort

her and removed her from the courtroom and outer room where she continued to moan to such an extent as to be audible to the jury and that affiant believes and alleges that the sympathies and passion of the jury were thereby aroused to such an extent that they were unable to give a fair and impartial consideration of the evidence in the case.

That during the examination of J. J. Dowling as a witness on behalf of defendant, counsel for plaintiff held certain typewritten sheets of paper before him and read, or pretended to read
353 certain statements to the effect that the explosion which caused the death of the plaintiff's decedent in this action was not caused by low water as contended by defendant, but that the same was caused by improper crown bolts used by defendant and that counsel for plaintiff then asked the witness whether, if such statements were a part of the report of the United States Boiler Inspectors who examined said engine after the explosion, he would believe them, or whether it would change his mind; that counsel for plaintiff repeated several questions incorporating, or pretending to incorporate, extracts from such a report and also asked the witness a similar question with reference to a statement, or purported statement, of the Chief Engineer of the American Locomotive Works, to the effect that buttonhead crown bolts of the type used by the Great Northern Railway Company were improper; that affiant is not informed as to whether said extracts were actually a part of any report of said Federal Boiler Inspectors or a part of any letter from the Chief Engineer of the American Locomotive Works, or not; that if they were not actually a part of such report or letter, affiant alleges that counsel read them for the purpose of conveying to the jury the impression that such a report had actually been made, and such a letter actually written; that if it is a fact that said extracts were actually taken from such a report and letter, affiant alleges that the same were not properly admissible as evidence in this action and that this fact was known to counsel for plaintiff and that counsel for plaintiff read said extracts for the sole purpose of informing the jury as to the contents of said report and letter, the same not being properly admissible in evidence; that counsel for plaintiff had no certification and no means of properly proving either said letter or said report if the same had been admissible, and never had any expectation or intention, or belief, that he could follow up said questions with any competent or legal proof
354 in support of the same; That affiant believes and alleges the fact to be, that counsel for plaintiff asked said questions knowing the same to be objectionable and for the sole purpose of compelling counsel for defendant to object to the same, thereby creating the impression in the minds of the jury that such a report was disadvantageous to defendant and that defendant would be unwilling to have them hear the same, or in the hope that counsel for defendant would be deterred by these considerations from objecting to such questions and that the contents of said report would thereby become known to the jury; that the extracts or purported extracts from said report were highly prejudicial to the defendant; that

affiant has had nine years' experience in trial work in the State of Washington and nearly six years as attorney for the Great Northern Railway Company, engaged in the trial of jury cases, and has frequently discussed a verdict and the reasons controlling the same with members of juries who have been discharged from further service, and that affiant has thereby become, and is, familiar with the considerations which frequently control the juries in the return of their verdict and that it is the opinion of affiant that it would be prejudicial to defendant to object to questions such as those asked by counsel for plaintiff and that the jury would necessarily draw the deduction that the report was disadvantageous and that defendant was afraid to have it read; and it is further the opinion of affiant that the mere reading of a purported extract from such a report produces in the minds of the jury the impression that such extracts are genuine; that affiant believes and alleges the fact to be that the aforesaid conduct of counsel for plaintiff was misconduct highly prejudicial to defendant and that the same influenced the jury in the determination of their verdict.

That after counsel for defendant objected to the form of cross-examination being pursued by counsel for plaintiff aforesaid, and suggested in support of said objection that the genuineness of said report could not be properly proven in this case, counsel for
355 plaintiff requested affiant in open court and in the presence of the jury, to consent to the producing of said report, knowing that the production of the same was forbidden by United States statute; that affiant believes and alleges that counsel for plaintiff did not then have, and has never had, any properly certified copy of any such report to produce even if the same had been admissible and that said request was made of counsel for defendant for the sole purpose of giving the jury the impression that defendant did not wish said report to be produced.

That counsel for plaintiff thereupon called as a witness one James McCabe, and questioned him as to whether or not the document from which counsel for plaintiff had been reading extracts in asking said questions, was not a report which he had received from the Interstate Commerce Commission or Chief Boiler Inspector of the United States in reply to his request for a report on said explosion, that counsel for plaintiff knew when he called said witness and when he asked said question, that the said report was inadmissible and that if the same had been admissible, it could not be properly proven by said witness or by said questions, and that said witness was called, and said question asked, for the sole purpose of strengthening the minds of the jury in the impression already created, by counsel's cross-examination, that the report of the Federal inspector on said explosion was adverse to the defendant and that defendant was unwilling to have the same produced, and for the purpose of compelling counsel for defendant to object to said questions and to thereby create in the minds of the jury the impression that said report would be disadvantageous to defendant.

That during the closing argument by counsel for plaintiff, and when counsel for affiant had no further opportunity to reply thereto,

counsel for plaintiff made the statement to the jury that affiant had stated in his opening statement to the jury that plaintiff might produce the report of the Federal inspectors on the said explosion if they cared to do so; that in truth, and in fact,

356 affiant never made any such statement in his opening statement to the jury or at any other time; that affiant did say to the jury in his opening statement that no accident had ever been known to occur from the use of buttonhead crown bolts and that there was no case on record where the use of fusible plugs had prevented an explosion, while there were cases where explosions had occurred with fusible plugs being used, and affiant then added the statement that if such cases had existed, the plaintiff could get information about them from the United States reports, since all such accidents were reported to the United States Government; but affiant made no statement that plaintiff could, or that affiant would consent to such reports themselves being introduced in evidence in this case and that affiant made no reference whatever at any time during the progress of this action to any report covering the explosion involved in this action, and that the said statement made by counsel for plaintiff in his closing argument was untrue and made for the purpose of misleading the jury.

That on the first day of the trial, affiant requested one Peron, a witness for plaintiff, to make certain tests on the heads of crown bolts recovered from the explosion involved in this action and to report regarding the same the next morning; that on the following morning affiant twice called for the said witness Peron and he was not in the courtroom and that affiant commented upon this fact in his argument to the jury; that thereafter, and in his closing argument, to which affiant had no opportunity of replying counsel for plaintiff stated to the jury that the reason said Peron was not in the courtroom was that he, counsel for plaintiff, had asked affiant if Peron would be required and that affiant had answered no. That in truth, and in fact, no such question was asked of affiant until after the plaintiff's case was rested and the cross-examination of his witnesses closed and that affiant did not then state to counsel for plaintiff that he had not wished to recall said witness but

357 that affiant simply made the statement that he had wished to cross-examine him further as a part of plaintiff's case and that affiant supposed it was now too late to do that inasmuch as defendant's case was then being put on; that affiant did not excuse said Peron or consent to his absence at any time until after the defendant was presenting its case in chief and that affiant did in fact twice call for said witness for further cross-examination and that the statement made by counsel for plaintiff to the jury was misleading and made for the purpose of giving the jury the impression that the testimony of said Peron would be unfavorable to the defendant and that defendant was unwilling to recall him.

That affiant believes and alleges that the verdict of the jury was not supported by any competent evidence and that the preponderance of the evidence was overwhelmingly in favor of the defendant and that the jury did not, and could not, base their verdict upon

any evidence of fault or responsibility on the part of the defendant but that the jury were influenced by sympathy for the plaintiff and prejudice against the defendant, fostered and encouraged by the aforesaid acts of the plaintiff herself and by the aforesaid misconduct of the plaintiff's attorneys.

358 Affiant further alleges that the closing argument of the plaintiff's attorneys was based largely on the testimony of one Hanson, who had testified that there was water in the waterglass just prior to the explosion, indicating that there was sufficient water in the boiler and that the explosion must have been due to some defect in the locomotive; that this argument and this testimony had not been suggested or referred to in any way or touched upon in the opening argument of plaintiff's attorney, and that affiant therefore had no opportunity to reply to the same, and affiant believes and alleges that it was improper for plaintiff's counsel to bring up in closing new arguments which had not been referred to in opening and to which affiant had no opportunity of replying; that affiant requested permission of the court to reply to said argument but that the same was refused.

F. G. DORETY.

Signed, subscribed and sworn to before me this 24th day of June, 1914.

[L. M. Knox, N. P. Seal.]

L. M. KNOX,

*Notary Public in and for the State of
Washington, Residing in Seattle.*

Com. Exp. Dec. 1, 1914.

Endorsed: Filed June 27, 1914, 9:35 A. M. W. F. Martin,
County Clerk.

359 In the Superior Court of the State of Washington in and for
the County of Snohomish.

No. 13831.

ADALINE DONALDSON, as Administratrix of the Estate of Vance H.
Thoms, Deceased, Plaintiff,

vs.

GREAT NORTHERN RAILWAY COMPANY, a Corporation, Defendant.

Affidavit.

STATE OF WASHINGTON,
County of King, ss:

Hyman Zettler and James McCabe, being first duly sworn on oath, each for himself says: That they are attorneys for the plaintiff in the above entitled action, and as such tried the case for her; that while it is true that plaintiff lost control of herself for a very brief

time twice during the long trial, it was caused mainly by the fact that defendant placed and maintained in the courtroom during the entire trial a large black box,—purporting, we believe, to represent a locomotive boiler—but which black box was never used in the trial at all—that such black box was suggestive of a coffin and was largely responsible for plaintiff's acts; that none of her actions were at all intentional but that she was immediately removed from the courtroom out of the hearing of the jury; that during the argument when she was taken out, she was kept out, and entirely away from the hearing of the jury during the entire remainder of the case; that affiants believe that if plaintiff's actions had any effect on the jury, it was adverse to her; that no objection was made by defendant, nor did it make any application to the court to instruct the jury to disregard this.

Referring to that portion of Mr. Dorety's affidavit beginning at the bottom of page 1 and extending to the middle of page 360 5, affiants say that the written opinion of the chief engineer of the American Locomotive Works and the report of the Federal Boiler Inspector referred to by Mr. Dorety were exactly what they were purported to be — actual and true statements of the chief engineer of the American Locomotive Works and of the Federal Boiler Inspection Department as received from them; that they were not in any manner whatsoever fictitious as Mr. Dorety insinuates—that Mr. Dorety in his opening statement did state to the jury in effect that such a Federal report was in existence, was printed and published by the United States government and could be produced by the plaintiff in court, thereby leading the jury to believe that if plaintiff did not produce said report it was unfavorable to her; that immediately upon the very first objection of counsel for defendant showing that he intended to prevent plaintiff from using said report, affiants immediately ceased all reference whatsoever to said report; that affiant's actions in this connection were entirely bona fide and occasioned by Mr. Dorety's opening statement.

Referring to the last paragraph on page 4 of Mr. Dorety's affidavit, affiants say that any reference to the Federal report in counsel's closing argument to jury was caused by Mr. Dorety's statement in his address to the jury, accusing counsel for plaintiff with unfair tactics in respect to said report, and that no reference at all to said report would have been made, had not Mr. Dorety unfairly made such accusation in his argument to the jury.

Referring to the last part of page 5 and the first part of page 6 of Mr. Dorety's affidavit in regard to Mr. Pierron, affiants say that Mr. Dorety, on Tuesday morning June 16, 1914, the second day of the trial, did call for said witness—that shortly before one-thirty o'clock of the same day affiant McCabe, in the absence of the jury, notified Mr. Dorety that Mr. Pierron could and would be produced in court for further cross-examination by Mr. Dorety if

361 Mr. Dorety so desired; that Mr. Dorety in the presence of both affiants, and not in the presence or hearing of the jury, then said that he did not need Mr. Pierron any more and that Mr. Pierron could be allowed to go home; that defendant made no

application to the court requiring Mr. Pierron's attendance; that any reference to Mr. Pierron's absence made by plaintiff's counsel during the latter part of the closing argument was the actual facts and was caused solely by Mr. Dorety's unfair statement to the jury in his argument to the effect that Mr. Pierron had "disappeared," leading the jury to believe to the contrary of the actual facts; that the court at that time specifically instructed the jury to disregard all statements of counsel not borne out by the evidence received during the trial.

Referring to the last paragraph of Mr. Dorety's affidavit in regard to the argument of plaintiff's counsel in regard to Mr. Hanson's testimony, affiants state that the opening argument for plaintiff and the answering argument for defendant dwelt largely with whether the explosion was caused by low water and that plaintiff's counsel's reply argument called attention to the fact that Mr. Hanson's testimony tended to show that there was no low water.

HYMAN ZETTLER,
JAMES McCABE.

Subscribed and sworn to before me this 24 day of June, 1914.

WILLIAM E. FROUDE,
*Notary Public in and for the State of
Washington, Residing at Seattle.*

Filed Jun-25, 1914. W. F. Martin, County Clerk.

362 In the Superior Court of the State of Washington in and for
the County of Snohomish.

No. 13831.

ADALINE DONALDSON, as Administratrix of the Estate of Vance H.
Thoms, Deceased, Plaintiff.

vs.

GREAT NORTHERN RAILWAY COMPANY, a Corporation, Defendant.

Judgment.

This cause having come on regularly for trial, plaintiff appearing by her attorneys, James McCabe and Higgins & Hughes, and the defendant appearing by its attorneys, F. V. Brown and F. G. Dorety, both parties having introduced evidence, and the cause being duly submitted to the jury, and the jury having regularly returned a verdict in favor of the plaintiff for the sum of \$8,500.00 the jury having been duly polled at defendant's request, whereby it appears that said verdict was the verdict of all 12 jurors, motions for new trial and judgment notwithstanding the verdict having been interposed by defendant, and denied.—

It is by the court ordered, adjudged and decreed that the plaintiff Adaline Donaldson, as administratrix of the estate of Vance H.

Thoms, deceased, do have and recover of and from the defendant, Great Northern Railway Company, a corporation, for the benefit of said Adaline Donaldson as mother of said Vance H. Thoms, the sum of \$8,500.00 and costs herein to be taxed.

Done in open court this 3d day of August, 1914.

RALPH C. BELL, *Judge.*

Copy of the within prepared judgment received and due service of same acknowledged the 24th day of July, 1914.

F. G. DORETY,
Attorney for Def't.

Filed Aug. 3, 1914. W. F. Martin, County Clerk.

333 In the Superior Court of the State of Washington for Snohomish County.

No. 13831.

ADALINE DONALDSON, as Administratrix of the Estate of Vance H. Thoms, Deceased, Plaintiff,

vs.

GREAT NORTHERN RAILWAY COMPANY, a Corporation, Defendant.

Notice of Appeal.

To the above-named plaintiff, Adaline Donaldson, as administratrix of the estate of Vance H. Thoms, deceased, and to her attorneys, Higgins & Hughes and James McCabe:

You, and each of you, will please take notice that the defendant in the above entitled action feeling aggrieved by the judgment rendered therein, does hereby appeal from said judgment to the Supreme Court of the State of Washington. The judgment appealed from is the final judgment in the above entitled action rendered by the above entitled court on the third day of August, 1914, in favor of the plaintiff and against the defendant for the sum of Eight Thousand Five Hundred Dollars (\$8,500.00) and costs of suit; and this appeal is taken from the whole of said judgment and each and every part thereof, and from the order of the court denying defendant's motion for judgment notwithstanding the verdict and from the order of the court denying defendant's motion for a new trial.

Dated at Seattle, King County, Washington, this 11th day of August, 1914.

F. V. BROWN,
F. G. DORETY,
Attorneys for Defendant.

We hereby acknowledge service of the foregoing Notice of Appeal and the receipt of a true copy thereof, this 11th day of August, 1914.

JAMES McCABE &
HIGGINS & HUGHES,
Attorneys for Resp.

Filed Aug. 12, 1914. W. F. Martin, County Clerk.

364 In the Superior Court of the State of Washington for Snohomish County.

No. 13831.

ADALINE DONALDSON, as Administratrix of the Estate of Vance H. Thoms, Deceased, Plaintiff,

VS.

GREAT NORTHERN RAILWAY COMPANY, a Corporation, Defendant.

Appeal Bond.

Know all men by these presents: That we, the Great Northern Railway Company, defendant in the above entitled action, as principal and the National Surety Company, a corporation of the State of New York, as surety, are held and firmly bound unto Adaline Donaldson, as Administratrix of the estate of Vance H. Thoms, deceased, plaintiff in the above entitled action, in the penal sum of Eighteen Thousand Dollars (\$18,000.00) lawful money of the United States to be paid to the said Adaline Donaldson, as Administratrix of the estate of Vance H. Thoms, deceased, and her heirs, administrators, successors or assigns, for which payment, well and truly to be made we bind ourselves and our and each of our successors and assign, jointly and severally, firmly by these presents.

Scaled with our seals, and dated this 11th day of August, 1914.

The condition of the foregoing obligation is such, that whereas, on the third day of August, 1914, in the above entitled action the above entitled court rendered judgment in favor of the plaintiff and against the defendant for the sum of Eight Thousand Five Hundred Dollars (\$8,500.00) and costs of suit; and,

Whereas, the said defendant, Great Northern Railway Company, the principal in this obligation, feeling aggrieved by said judgment, has taken an appeal therefrom to the Supreme Court of the State of Washington, and claims a stay of proceedings during the pendency of said appeal.

365 Now therefore, if the said defendant Great Northern Railway Company shall well and truly pay all costs and damages that may be awarded against it on the appeal or on the dismissal thereof, not exceeding Two Hundred Dollars (\$200.00) and shall well and truly satisfy and perform said judgment in case it shall be affirmed, and any judgment or order which the Supreme Court may render, or make, or order to be rendered or made by the Superior

Court, then the foregoing obligation shall be void; otherwise to remain in full force and effect.

GREAT NORTHERN RAILWAY
COMPANY.

[SEAL.]

By F. G. DORETY, *Its Attorney*.

NATIONAL SURETY COMPANY,

By GEO. W. ALLEN, *Resident Vice-President*,

E. P. WELCH, *Resident Assistant Secretary*.

[Seal National Surety Company, Incorporated 1897, New York.]

Approved this 12th day of August, 1914.

RALPH C. BELL, *Judge*.

We hereby acknowledge service of the foregoing Bond and the receipt of a true copy thereof, this 11 day of Aug., 1914.

JAMES McCABE &

HIGGINS & HUGHES,

Attorneys for Resp.

Filed Aug. 12, 1914. W. F. Martin, County Clerk.

366 *Assignment of Errors as Set Forth in Appellant's Brief.*

I.

The Superior Court of Snohomish County erred in admitting evidence over defendant's objection, of conversations between the deceased and the witness Thomas Hanson as to the intentions of the deceased with regard to supporting his mother. (St. p. 6, ll. 5 to 28; Ab. pp. 7, 8.)

II.

Said court erred in admitting evidence over defendant's objection, of a conversation between the deceased and the witness Adaline Donaldson as to the plans of the deceased. (St. p. 84, l. 29; Ab. p. 49.)

III.

Said court erred in admitting evidence over defendant's objection, of a conversation between the deceased and the witness Mrs. Ursula Little with regard to the intentions of the deceased. (St. p. 87, l. 12; Ab. p. 51.)

IV.

Said court erred in refusing to permit the defendant to cross-examine the witness Thomas Hanson as to whether he was firing on the deceased, when the latter was reprimanded for being asleep on his engine. (St. p. 13, l. 13; Ab. p. 12.)

V.

Said court erred in permitting the witness Charles E. McGrath to state his opinion, over defendant's objection, as to the effect of the heat from an oil flame on flues or flue sheets in a locomotive. (St. p. 23, l. 5; Ab. p. 18.)

VI.

Said court erred in permitting the witness Charles E. McGrath to state his opinion, over defendant's objection, as to the effect of the heat of an oil burning flame on the buttonhead of a crown bolt. (St. p. 23, l. 27; Ab. p. 18.)

VII.

Said court erred in permitting the witness C. E. Pierron to testify as to the nature and purpose of safety fusible plugs, over the objection of defendant. (St. p. 61, l. 25; Ab. p. 36.)

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VIII.

Said court erred in refusing to require the plaintiff to elect whether she would proceed on the theory that there was a sufficient supply of water in the boiler at the time of the explosion, or on the theory that there was an insufficient supply, and that a fusible plug would have prevented the explosion. (St. p. 61, l. 29; Ab. pp. 36, 37.)

IX.

Said court erred in permitting the witness C. E. Pierron, over the objection of the defendant, to testify as to what, in his experience, had been the custom of railroad companies with respect to using fusible plugs. (St. p. 62, l. 32; Ab. p. 37.)

X.

Said court erred in permitting the witness C. E. Pierron to testify over the objection of the defendant, as to the custom of railroad companies in regard to allowing scale to form in their boilers. (St. p. 64, l. 25; Ab. p. 38.)

XI.

Said court erred in refusing to permit the witness C. E. Pierron, as a part of his cross-examination, to test the heads of bolts from engine 1902 with a chisel and hammer. (St. p. 74, l. 23; Ab. pp. 43, 44.)

XII.

Said court erred in refusing to permit the jury to inspect a test on an oil burning locomotive, to determine whether the oil fire would heat the buttonheads red hot or not. (St. pp. 212, 213; Ab. p. 124.)

XIII.

Said court erred in refusing to permit the defendant to cross-examine the witness James McCabe as to whether it was not a fact that he had been specializing in personal injury cases against the Great Northern. (St. p. 110, l. 27.)

XIV.

Said court erred in permitting the plaintiff to cross-examine the defendant's witness John T. Johnson, as to whether a hypothetical opinion of some engineer of the American Locomotive Company, to the effect that buttonheaded bolts are unsuitable, was correct or incorrect. (St. p. 189, ll. 8 to 18; Ab. pp. 110, l. 1.)

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XV.

Said court erred in permitting the witness James McCabe to testify that he had made application to the Federal inspectors for their report on the accident involved in this action. (St. p. 247, l. 25; Ab. p. 146.)

XVI.

Said court erred in permitting the witness James McCabe to testify that the document handed to him was the Federal report on said accident. (St. p. 248, l. 2; Ab. p. 146.)

XVII.

Said court erred in refusing to instruct the jury as requested by the defendant, as follows:

"You are instructed that even where an employer, such as a railroad company, is negligent in the construction or maintenance of its tools or equipment, such as a locomotive, yet, an employee who accepts, or continues his employment, knowing of the existence of such defects or negligence, and knowing of the danger therefrom, assumes the risk of the injury to himself from such defects and cannot recover if he is injured as a result of them. This would not be true in the present case, if the negligence or defects involved some violation of a United States statute, but there is no evidence of any violation of such a statute in this action, so that the rule which I have just given to you would apply in this case. Therefore, even if you find that the defendant company had been negligent in adopting an improper type of bolt, or in failing to install fusible plugs, or in some other particular in the construction or maintenance of this boiler, and even though you should also find that such negligence caused the explosion, still, the plaintiff cannot recover in this action, if you should also find that the deceased, V. H. Thoms, was familiar with the type of construction used, or the particular form of negligence involved, and knew the danger likely to arise therefrom, or if, in the exercise of a reasonable care, he should have known of these things prior to the time of his injury." (Ab. p. 175.)

XVIII.

Said court erred in refusing to instruct the jury, as requested by the defendant, as follows:

"It is admitted on both sides, that the absence of a fusible plug in the crown sheet of the locomotive at the time of the explosion, could not have caused the explosion, and that the explosion could not have been prevented by the use of a fusible plug at that time, if there were a proper supply of water on the crown sheet. Therefore, if you should find that there was a proper supply of water on the crown sheet, you are instructed that you cannot find a verdict against the defendant on the ground that it was not using a fusible plug." (Ab. p. 176.)

XIX.

Said court erred in refusing to instruct the jury, as requested by the defendant, as follows:

369 "You are instructed that under the evidence in this case, the failure of the Great Northern Railway Company to use the fusible plug on its crown sheet, cannot be regarded in law as a cause of the explosion, and you should, therefore, disregard all evidence upon that subject. You cannot find a verdict in favor of the plaintiff upon the ground of the defendant's failure to use a fusible plug in its crown sheet." (Ab. p. 176.)

XX.

Said court erred in giving to the jury its instruction No. 5 to the effect that if negligence of the defendant, in any particular set forth in the complaint, was the direct cause of the death of the decedent, then the plaintiff could recover, unless the decedent had assumed the risk; the said error consisting in the failure of the court to qualify said instruction, by making it a condition thereof, that the deceased was not himself guilty of negligence causing the accident. (Ab. p. 178.)

XXI.

Said court erred in giving to the jury its instruction No. 6, reading as follows:

"You are instructed that the law provides that it shall be unlawful for any common carrier, as was the defendant, engaged in interstate commerce, to use any locomotive engine propelled by steam power, unless the boiler of the locomotive and appurtenances thereof are in proper condition and safe to operate in the service to which the same is put, that the same may be employed in the active service of said carrier in moving traffic, without unnecessary peril to life and limb; and that no employe shall be deemed to have assumed any risk of death by reason of any locomotive engine operated in violation of said law, and that no employe injured or killed by reason of a locomotive engine operated in violation of said law shall be held to have been guilty of contributory negligence.

"Therefore, if you shall believe, from a fair preponderance of all the evidence in the case, that the boiler of the locomotive engine No. 1902 or the appurtenances thereof were not in proper condition and safe to operate in the active service of the defendant in moving traffic without unnecessary peril to life or limb, by reason of the negligence of the defendant, in any one or more of the three respects alleged in the complaint, then and in that case Vance H. Thoms assumed no risk of death and was guilty of no contributory negligence, and the affirmative defenses must fail.

"However if such boiler and appurtenances were in proper condition and safe for such use in moving traffic, but due to defendant's negligence were defective in one or more of the respects alleged in the complaint and Vance H. Thoms had actual knowledge of such defect or defects, or such defects were so plainly observable that in the reasonable exercise of his faculties he should have known of such and may be presumed to have known thereof and the dangers that surrounded him, then Vance H. Thoms assumed the risks of injury and the plaintiff cannot recover in this action.

"So, also, if such boiler and appurtenances were in proper condition and safe for such use in moving traffic, but due to defendant's negligence were defective in one or more of the respects alleged, Vance H. Thoms would have been guilty of contributory negligence if he failed to exercise such care and prudence as an ordinary and prudent and careful person engaged in like employment under like circumstances would usually and ordinarily exercise, with
370 the legal effect and result set forth in the following instructions." (Ab. pp. 179, 180.)

XXII.

Said court erred in giving to the jury its instruction No. 7, reading as follows:

"You are further instructed that under the law which governs this case, even though you should find that Vance H. Thoms was guilty of contributory negligence and did not himself use due care, this fact alone would not necessarily prevent the plaintiff from recovering a verdict at your hands if the defendant was negligent in one or more of the respects alleged."

"In other words, even though Vance H. Thoms did not himself use due care, such is not of itself a complete bar to plaintiff's recovery if the fair preponderance of the evidence establishes that the defendant was guilty of negligence in any one or more of the three manners alleged, and that such negligence directly caused the death of Thoms; but in that case the contributory negligence of Vance H. Thoms, if any, must be allowed by you to have the effect of reducing the damages, if any, found by you to have been sustained by plaintiff in the proportion which his—Thoms'—contributory negligence bears to the combined negligence of himself and the defendant, if you shall find that defendant was negligent". (Ab. p. 182.)

XXIII.

Said court erred in giving to the jury its instruction No. 13 and particularly the first paragraph thereof, reading as follows:

"You are further instructed that upon retiring to the jury room you will elect one of your number foreman, and when any ten of you have agreed upon a verdict, the foreman will sign and date the same, and indicate to the bailiff that the jury has agreed, but shall not tell the bailiff or any other person until the verdict is read in open court what the verdict is." (Ab. pp. 184, 185.)

XXIV.

Said court erred in overruling defendant's demurrer to the amended complaint and motion for dismissal of this action, upon the ground of lack of jurisdiction. (Ab. p. 189.)

XXV.

Said court erred in denying defendant's challenge to the sufficiency of the evidence and motion for a directed verdict at the close of the plaintiff's evidence. (St. p. 122, ll. 1 to 4; Ab. p. 68.)

XXVI.

Said court erred in denying the defendant's motion for judgment, notwithstanding the verdict. (Ab. pp. 189, 199.)

XXVII.

Said court erred in denying defendant's alternative motion for a new trial. (Ab. pp. 189 to 199.)

371

Department Two.

Filed Jan. 10, 1916.

No. 12500.

ADALINE DONALDSON, as Administratrix of the Estate of Vance H.
Thoms, Deceased, Respondent,

v.

GREAT NORTHERN RAILWAY COMPANY, Appellant.

Per Curiam :

This is an appeal from a judgment for the plaintiff entered after denial of motions for judgment non obstante and new trial, upon the verdict of a jury in an action brought under the Federal Employer's Liability Act, to recover damages for the death of her son Vance H.

Thoms, which she alleged was due to the negligence of the appellant.

On November 5, 1913, Thoms was an engineer in the employ of the appellant, and was on that date operating engine No. 1902, which was one of three engaged in hauling a freight train between Skykomish and Scenic. When near the station at Tonga, the boiler exploded and Thoms was killed. It is admitted that engine No. 1902 was originally a coal burner and several years prior to the accident had been changed into an oil burner. When equipped as a coal burner, the stay bolts which extend from the main shell through the water space and support the crown sheet, were secured to the latter by button heads as is customary in coal burners. When the change was made from coal to oil, these bolt heads were not changed. Whether the explosion was due to this fact is a principal ground of controversy.

The appellant and the respondent each have an explanation of the cause of the explosion. The respondent asserts that it was due to the use of button head instead of taper head bolts on an oil burner; that it was due to the lack of fusible plugs, and to an accumulation of scale on the crown sheet; all of which it is alleged was due to negligence of the appellant. Appellant contends that the explosion was due entirely to low water in the boiler which was solely the negligence of the deceased. Testimony was introduced in support of each theory, and there is thus presented a direct conflict in evidence on which the verdict of the jury, if the question was properly submitted, is conclusive, regardless of our own opinion as to weight of the evidence.

Parker v. Wash. Tug & Barge Co., 85 Wash. 575;

Lombardi v. Bates & Rogers Constr. Co., 46 Wash. Dec. 110.

Ordinarily we will not under such circumstances review the record further than to discover whether there is evidence to support the verdict, and having found such evidence we will accept the verdict as conclusive. However, the appellant urges that the evidence presented by the respondent is so meagre, unreliable, and lacking in probative value and the evidence opposing it in such preponderance, that the denial of the motion for judgment non obstante verdicto or for new trial was an abuse of discretion on the part of the trial court. The amount of the verdict and the seriousness with which appellant argues the point, coupled with the somewhat novel character of the grounds urged and their evident importance to appellant, have impelled us to give as briefly as possible the reasons why we are unable to accede to the arguments advanced.

The essence of appellant's contention is that the condition of the crown sheet, bolts and flues after the explosion shows conclusively as a scientific fact that the explosion could not have been due to any other cause than low water. Appellant introduced the testimony of over a dozen boiler makers, master mechanics, boiler inspectors and others, all of whom stated positively that the conditions after the explosion conclusively showed low water as the cause. We do not agree,

however, that this testimony established undisputed scientific facts. The evidence at best was of a negative character and the statements of the witnesses were their opinions drawn from their previous experiences. Because they had never known the conditions shown here to occur except from a low water explosion, they concluded that they could not result otherwise. On behalf of the respondent one Hanson, fireman on the engine when the explosion occurred, testified positively that the water glass showed sufficient water on the crown sheet to prevent an explosion. An effort was made to impeach
373 this testimony by introducing a statement prepared by the attorneys for appellant and acknowledged as correct by Hanson while he was in the hospital after the explosion. Hanson denied any knowledge of this statement, claiming that he was unconscious for days after the explosion, and had made no such statements at any time. The credibility of his testimony was clearly for the jury. We have, then, the evidence of the only witness who was in a position to know positively whether there was water in the boiler, to the effect that the water glass indicated sufficient to prevent a low-water explosion. Opposed to this is the testimony of a large number of capable experts that the explosion could have been due only to low water. Under such conditions it was clearly competent for the jury to determine that the testimony of Hanson was entitled to greater weight than that of appellant's witnesses. We conclude that on this ground appellant was not entitled to judgment, and that the denial of a new trial was not an abuse of discretion.

Appellant contends that, even if it be found that the evidence of low water was a question for the jury, nevertheless the evidence did not show any negligence on the part of the appellant. Coupled with this contention is an attack on the character of respondent's expert testimony. The contention is not made that there was a total lack of evidence of negligence, and there being some evidence that the button head bolts have a tendency to become overheated by an oil flame and allow the crown sheet to give, which result in an explosion, it was for the jury to say whether their use under such circumstances was negligence. Likewise, as to the use of fusible plugs as a means of preventing explosions and as to the presence or absence of scale on the crown sheet. The reliability of respondent's witnesses and the sufficiency and consistency of their testimony are all questions which the verdict precludes us from reviewing.

The most serious contention, aside from the questions of evidence just discussed, is a claim that a new trial should be allowed because of misconduct of respondent's counsel in questioning appellant's witness Dowling, Superintendent of Safety for the Great Northern,
374 dent. The use of those reports or any part thereof "for any purpose in any suit or action for damages growing out of any matter mentioned in said report or investigation" is, by statute, 36 St. L., 916, made unlawful. During the cross-examination of the witness, counsel for respondent asked him whether he considered the government inspectors were wrong in their conclusions, if

their report on the accident stated that certain conditions found after the explosion could not have resulted from a lowwater explosion. After the examination had proceeded for some time and the witness had had several features of the report stated to him and had been asked his opinion as to the worth of the conclusions, appellant's counsel objected to the line of cross-examination but did not base the objection on the inadmissibility of the report. Respondent's counsel was stopped; whereupon he attempted to put the report in evidence. The offer was refused. Under the Federal law that report was absolutely inadmissible, but we do not believe that appellant is in a position to complain of the conduct of respondent's counsel in asking the witness about the report. In his opening statement appellant's counsel stated to the jury: "We will show that whenever an accident of this kind happens it is reported to the United States government and an inspection is made and reports printed and published, and the data is available so that the plaintiffs can have access to it and produce it if they so desire, as correct." Respondent was justified in construing this as a challenge to produce the report. The fact that the error, if any, was thus invited by appellant, and his failure to object on the ground of the inadmissibility of the report until the harm, if any, had been done, force us to the conclusion that appellant cannot now complain that he was prejudiced by the action of respondent.

The verdict awarded respondent \$8,500. Appellant now contends that this amount is excessive and conclusive proof that it was influenced by passion and prejudice. At the time of his death the deceased was earning about \$175 per month. He was living with his mother and furnishing \$75 per month or more to maintain the home kept for him by her. He had expressed his intention of not

375 marrying as long as his mother lived. The income from this verdict well invested would not enable the respondent to live in better circumstances than those to which she was accustomed during her son's life, and in view of her possibly greater needs during her declining years, we do not find the verdict excessive. As one of the grounds for a new trial appellant introduced affidavits to the effect that respondent had previously supported herself and had other means of support. We do not find, however, that there was an abuse of discretion in denying a new trial on these grounds.

Appellant contends that the instruction that an agreement by ten jurors would be sufficient is in violation of the seventh amendment to the constitution of the United States, which has been generally construed to contemplate a trial by twelve jurors. It is, however, well settled that this amendment does not apply to the states, and that the verdict in an action in the state court under the Federal Employers' Liability Act is controlled, not by the provision of the national constitution, but by the laws of the state where the suit is pending. The authorities are collated and the rule well stated in *Roberts, Injuries to Interstate Employees*, p. 312, § 176.

Several other grounds of error are urged in the request for a

new trial. These have all been considered without convincing us that there is error warranting a new trial of this case.

The judgment is therefore affirmed.

376 Filed in Supreme Court of Washington, Feb. 9, 1916. C. S. Reinhart, Clerk.

Received Feb. 9, 1916. Office Clerk Supreme Court.

Denied Mar. 4, 1916.

In the Supreme Court of the State of Washington.

No. 12500.

ADALINE DONALDSON, as Administratrix of the Estate of Vance H. Thoms, Deceased, Respondent,

v.

GREAT NORTHERN RAILWAY COMPANY, Appellant.

Petition for Decision on Motion and Petition for Rehearing.

The appellant desires to call to the attention of the court the fact that the court has failed to render an order either way as to whether or not interest should be charged from March 1, 1915, to June 17, 1915, upon the amount of the judgment. This arises upon our motion to strike the respondent's brief on the ground that the same was not filed within the time required by law upon our contention that under the stipulation of the parties, the court should decide whether or not during the period of the continuance we should be charged with interest. This matter is fully explained on page 105 of our reply brief and we respectfully call the court's attention to this matter and request that this question be determined by the decision.

Petition for Rehearing.

The opinion states that all the various grounds of error set up in the briefs, which were not discussed by the court in the opinion, had nevertheless been fully considered and it is not our intention therefore to refer again to any of these. However, in the questions which were discussed by the court, there seem to be two or three manifest misunderstandings, and as it is the intention of the appellant to present these questions before the Supreme Court of the United States, it seems only fair that we should leave no possibility for even the appearance of an inadvertence.

On page 91 of the opinion (Advance Sheets Vol. 47, No. 2) the court says:

"The contention is not made that there was a total lack of

377 evidence of negligence, and there being some evidence
 * * * it was for the jury to say whether their use under
 such circumstances was negligence."

It is apparent from this that we failed to make our position clear, for we certainly did contend that, even granting that the testimony of the fireman Hanson raised a conflict and that there was water in the boiler, still, there was absolutely no shred of evidence to indicate any negligence as a cause of the explosion. Granting, as the court states, that there was some near expert testimony of defective construction, it must be apparent that such evidence is immaterial and not properly a part of the record unless it is connected in some way with the explosion. Evidence of a burned out headlight or a broken flange on a wheel may, in an abstract sense, be regarded as an evidence of negligence; so, purely in an abstract way, evidence of the use of a bolthead such that it might tend to crystallize and might tend to cause an explosion might be regarded as evidence of negligence, but unless such evidence is connected up with the actual explosion in some way—unless there is some near expert opinion or some other indication that the negligence complained of caused the explosion, there can be no conflict and no issue for the jury to pass upon. This is fully discussed on pages 30 to 36 of our reply brief and this contention seems to have entirely escaped the attention of the court. We would not mention this again except for the fact that the authorities which we have quoted seem so conclusive and the record so clear, that we confess ourselves unable to understand just how it can be said that there was the slightest conflict for the jury to pass upon as to the question whether any negligence on our part caused the explosion.

On the question of misconduct of counsel in the use of the Federal inspector's report, we have nothing to add to the argument advanced in our brief but we feel impelled to protest that the court is not entirely fair to counsel in setting out the quotation from the opening statement to the jury on page 92 of the opinion, without its context. Reading this quotation alone it might appear to the bar

378 that counsel must have been guilty of a very gross stupidity
 in directly challenging the production of these reports. On
 the other hand if the two or three sentences preceding and
 following the one quoted were set out, and the sentence in question
 were judged with reference to its context, we feel, with all due respect
 to the court and opposing counsel, that the reasonable lawyers would
 be in a very small minority who would say that our statement would
 fairly bear any such construction as has been put upon it. The
 construction which this sentence was intended to bear, and what we
 believe is the only reasonable construction that can be placed upon
 it, is explained on pages 76 and 77 of our reply brief.

The sentence preceding and following that quoted in the court's opinion are set out in full in the last paragraph on page 69 and on page 70 of appellant's abstract of record.

There is one other portion of the court's reasoning which does not seem to us well founded and that is in the characterization of the evidence establishing certain scientific facts appearing in the

first paragraph on page 91 of the advance sheets. The court holds that our testimony did not establish the alleged scientific facts as such because it was of a negative character and based on opinions drawn from previous experiences. We are at a loss to understand this reasoning. If a witness should state that he saw a heavy weight floating in the air without any support whatever and various scientific witnesses should testify that this was impossible because of the law of gravity, it might be said in a sense that they were stating their opinions based on their previous experience, and in the same sense this is true of our expert testimony. We do not know how else the law of gravity or any other scientific fact can be established. Our witnesses testified positively, for instance, that steel at the temperature of a crown plate with water on it cannot be elongated and reduced in thickness without rupture. It seems to us that this is just as much a scientific fact as would be the statement that hydrogen and oxygen would unite to form water. A chemist would have to base his statement upon the fact that neither in his own
379 experience nor in the recorded experience of other scientists had there been an exception to this rule. It seems to us that our scientific testimony was of exactly the same nature and while we can see that the court is correct in a sense in characterizing this as "of a negative character" and "as opinions drawn from their previous experience," we fail to see wherein this case is distinguished from any other case in which scientific facts are established in the usual way.

We appreciate the fact that, while the court has viewed this case as one in which there was a conflict of evidence for the jury, it has, nevertheless, departed from its usual custom by stating in some detail the reasons which compel the court to its conclusion. The brief suggestions made in this petition may not affect the determination of the court in any way but we have, nevertheless, felt that inasmuch as the case is to be reviewed further, and inasmuch as the opinion has suggested to our minds that possibly there may have been misunderstanding on one or two points, it was only fair to submit this brief petition. For the above reasons the appellant respectfully petitions the court to grant a rehearing in the above case.

Respectfully submitted,

F. V. BROWN,
F. G. DORETY,
Attorneys for Appellant.

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No. 12500.

Department Two.

Filed M'ch 4, 1916.

ADALINE DONALDSON, as Administratrix of the Estate of Vance H.
Thoms, Deceased, Respondent,

vs.

GREAT NORTHERN RAILWAY COMPANY, Appellant.

PER CURIAM:

Appellant has filed a petition for a rehearing which, after due consideration, is denied. Our attention, however, is called to a stipulation entered into in connection with a motion to strike respondent's brief because of failure to file in time, and because of which the case was not heard here until the May, 1915 term. The stipulation provides that, if the judgment be affirmed the interest accruing during the period of continuance might be eliminated from the judgment in case the court should determine such a condition a proper one in denying the motion to strike the brief. This stipulation was overlooked in writing the opinion, although we had it in mind in reaching our conclusion, and intended to give effect to it. Not having done so in the opinion, we do so now. The opinion is modified to this extent: The judgment will not bear interest from March 1, 1915 to June 17, 1915. In all other respects the judgment will stand.

381 In the Supreme Court of the State of Washington, Saturday,
March 4, 1916.

No. 12500.

ADALINE DONALDSON, as Administratrix of the Estate of Vance H.
Thoms, Deceased, Respondent,

vs.

GREAT NORTHERN RAILWAY COMPANY, Appellant.

Judgment.

This cause having been heretofore submitted to the court upon the transcript of the record of the superior court of Snohomish county, and upon the argument of counsel, and the court having fully considered the same and being fully advised in the premises, it is now on this 4th day of March, A. D. 1916, on motion of James McCabe of counsel for respondent, considered, adjudged and decreed that the judgment of the said superior court be and the same is hereby affirmed, but with interest as herein provided only; the

petition for rehearing denied, and that the said Adaline Donaldson, as administratrix have and recover of and from the said Great Northern Railway Company and from the National Surety Company, surety, the sum of eight thousand five hundred dollars, and costs with legal interest thereon from August 13th, 1914, to March 1, 1915, and from June 17, 1915, until paid, the costs of this action taxed and allowed at one hundred & fourteen & 00 100 Dollars, and that execution issue therefor. And it is further ordered that this cause be remitted to the said superior court for further proceedings in accordance herewith.

382 In the Supreme Court of the State of Washington.

No. 12500.

ADALINE DONALDSON, as Administratrix of the Estate of Vance H. Thoms, Deceased, Respondent and Defendant in Error,

vs.

GREAT NORTHERN RAILWAY COMPANY, a Corporation, Appellant and Plaintiff in Error.

Order Allowing Writ of Error.

The above entitled matter coming on to be heard upon the petition of the appellant therein for a writ of error from the Supreme Court of the United States to the Supreme Court of the State of Washington, and upon examination of said petition and of the record in said matter, and desiring to give the petitioner an opportunity to present in the Supreme Court of the United States the questions presented by the record in said matter.

It is ordered that a writ of error be and the same is hereby allowed to this court from the Supreme Court of the United States and that said writ of error shall operate as a supersedeas, upon the filing and approving of a bond in due form in the sum of \$17,000.00.

GEO. E. MORRIS,

*Chief Justice of the Supreme Court
of the State of Washington*

Filed in Supreme Court of Washington. Mar. 7, 1916. C. S. Reinhart, Clerk.

383 In the Supreme Court of the State of Washington.

No. 12500.

ADALINE DONALDSON, as Administratrix of the Estate of Vance H. Thoms, Deceased, Respondent and Defendant in Error,

vs.

GREAT NORTHERN RAILWAY COMPANY, a Corporation, Appellant and Plaintiff in Error.

Filed in Supreme Court of Washington, Mar. 9, 1916. C. S. Reinhart, Clerk.

Writ of Error.

THE UNITED STATES OF AMERICA, ss.:

The President of the United States of America to the Honorable the Judges of the Supreme Court of the State of Washington, Greeting:

Because in the record and proceedings, as also in the rendition of the judgment of a plea which is in the said Supreme Court of the State of Washington, before you, or some of you, being the highest court of law or equity of the said state in which a decision could be had in the said suit between Adaline Donaldson, as Administratrix of the Estate of Vance T. Thoms, Deceased, and the Great Northern Railway Company, a corporation, wherein was drawn in question the validity of a treaty, or statute of, or an authority exercised under, the United States, and the decision was against their validity; or wherein was drawn in question the validity of a statute of, or an authority exercised under said state, on the ground of their being repugnant to the constitution, treaties, or laws of the United States, and the decision was in favor of such, their validity; or wherein was drawn in question the construction of a clause of the constitution, or of a treaty, or statute of, or commission held under, the United States, and the decision was against the title, right, privilege, or exemption specially set up or claimed under such clause of the

384 said constitution, treaty, statute, or commission, a manifest error hath happened, to the great damage to the said Great Northern Railway Company, as by its complaint appears, we being willing that error, if any hath been, should be duly corrected, and full and speedy justice done to the parties aforesaid in this behalf, do command you, if judgment be therein given, that then under your seal, distinctly and openly, you send the record and proceedings aforesaid, with all things concerning the same, to the Supreme Court of the United States, together with this writ, so that you have the same at Washington on the 8th day of May, A. D. 1916, in the said Supreme Court, to be then and there held, that the record and proceedings aforesaid being inspected, the said Supreme Court may cause further to be done therein, to correct that error,

what of right and according to the laws and customs of the United States should be done.

Witness The Honorable Edward D. White, Chief Justice of the said Supreme Court, the 9th day of March in the year of our Lord one thousand nine hundred and sixteen.

[Seal of the United States District Court, Western District of Washington.]

FRANK L. CROSBY,

Clerk U. S. Dist. Court, Western Dist. of Washington.

Allowed by—

GEO. E. MORRIS,

Chief Justice Supreme Court, State of Washington.

385 [Endorsed:] No. 12500. In the Supreme Court of the State of Washington. Adaline Donaldson, as Administratrix of the Estate of V. H. Thoms, Deceased, Respondent and Defendant in Error, v. Great Northern Railway Company, a Corporation, Appellant and Plaintiff in Error. Writ of Error.

386 In the Supreme Court of the State of Washington.

No. 12500.

ADALINE DONALDSON, as Administratrix of the Estate of Vance H. Thoms, Deceased, Respondent and Defendant in Error,

VS.

GREAT NORTHERN RAILWAY COMPANY, a Corporation, Appellant and Plaintiff in Error.

Filed in Supreme Court of Washington, Mar. 7, 1916. C. S. Reinhart, Clerk.

Assignment of Errors.

Now comes the said plaintiff in error and respectfully submits the following assignment of errors in connection with its petition for a writ of error herein, and further submits that in the record, proceedings, decision and final judgment of the Supreme Court of the State of Washington in the above entitled matter there is manifest error in this, to-wit:

1. That the said Supreme Court of the State of Washington erred in affirming the judgment of the Superior Court of the State of Washington in and for the County of Snohomish in said action.

2. That said Supreme Court of the State of Washington erred in holding and deciding that the above entitled defendant in error is entitled to any judgment against the above named plaintiff in error upon the record in the above entitled action and in failing to hold that said action should be dismissed.

3. That said Supreme Court of the State of Washington erred in holding that there was any evidence of negligence on the part of the plaintiff in error which caused or contributed to cause the injuries to or death of the decedent, and the damages sustained by defendant in error, within the meaning of the word "negligence" as set forth in "An Act relating to the liability of common carriers by railroad to their employes in certain cases" as passed by the Congress of the United States and approved April 22, 1908, and hereinafter referred to as the Employers' Liability Act.

4. That said Supreme Court of the State of Washington erred in holding that there was any evidence of causal relation
387 between any alleged negligence on the part of said plaintiff in error and the damages sustained by the defendant in error as set forth in the complaint within the requirements of said Act of Congress.

5. That said Supreme Court of the State of Washington erred in holding in effect that evidence of causal relation between the alleged negligence of the plaintiff in error and alleged damages to the defendant in error is not necessary in order to sustain a judgment in favor of the defendant in error and against the plaintiff in error in an action based on said Act of Congress.

6. That said Supreme Court of the State of Washington erred in refusing to hold that the said Superior Court of the State of Washington in and for Snohomish County should have granted the motion of the plaintiff in error asking the court to direct the jury to return its verdict in favor of said plaintiff in error and asking said court to enter judgment in favor of said plaintiff in error notwithstanding the verdict of the jury.

7. That said Supreme Court of the State of Washington erred in failing to hold that the said Superior Court of the County of Snohomish erred in refusing to instruct the jury as requested by plaintiff in error as follows:

"You are instructed that even where an employer, such as a railroad company, is negligent in the construction or maintenance of its tools or equipment, such as a locomotive, yet, an employe who accepts, or continues his employment, knowing of the existence of such defects or negligence, and knowing the danger therefrom, assumes the risk of the injury to himself from such defects and cannot recover if he is injured as a result of them. This would not be true in the present case, if the negligence or defects involved some violation of a United States statute, but there is no evidence of any violation of such a statute in this action, so that the rule which I have just given to you would apply in this case. Therefore, even if you find that the defendant company had been negligent in adopting an improper type of bolt, or in failing to install fusible plugs, or in some other particular in the construction or maintenance of this boiler, and even though you should also find that such negligence caused the explosion, still, the plaintiff cannot recover in this action, if you should also find that the deceased, V. H. Thoms, was familiar with the type of construction used, or the particular form of negligence involved, and knew the danger likely

to arise therefrom, or if, in the exercise of a reasonable care, he should have known of these things prior to the time of his injury."

388 8. Said Supreme Court of the State of Washington erred in sustaining the following instruction given to the jury by the said Superior Court of Snohomish County:

"You are instructed that the law provides that it shall be unlawful for any common carrier, as was the defendant, engaged in interstate commerce, to use any locomotive engine propelled by steam power, unless the boiler of the locomotive and appurtenances thereof are in proper condition and safe to operate in the service to which the same is put, that the same may be employed in the active service of said carrier in moving traffic, without unnecessary peril to life and limb; and that no employe shall be deemed to have assumed any risk of death by reason of any locomotive engine operated in violation of said law, and that no employe injured or killed by reason of a locomotive engine operated in violation of said law shall be held to have been guilty of contributory negligence.

"Therefore, if you shall believe, from a fair preponderance of all the evidence in the case, that the boiler of the locomotive engine No. 1902 or the appurtenances thereof were not in proper condition and safe to operate in the active service of the defendant in moving traffic without unnecessary peril to life or limb, by reason of the negligence of the defendant, in any one or more of the three respects alleged in the complaint, then and in that case Vance H. Thoms assumed no risk of death and was guilty of no contributory negligence, and the affirmative defenses must fail.

"However, if such boiler and appurtenances were in proper condition and safe for such use in moving traffic, but due to defendant's negligence were defective in one or more of the respects alleged in the complaint and Vance H. Thoms had actual knowledge of such defect or defects, or such defects were so plainly observable that in the reasonable exercise of his faculties he should have known of such and may be presumed to have known thereof and the dangers that surrounded him, then Vance H. Thoms assumed the risks of injury and the plaintiff cannot recover in this action.

"So, also, if such boiler and appurtenances were in proper condition and safe for such use in moving traffic, but due to defendant's negligence were defective in one or more of the respects alleged, Vance H. Thoms would have been guilty of contributory negligence if he failed to exercise such care and prudence as an ordinary and prudent and careful person engaged in like employment under like circumstances would usually and ordinarily exercise, with the legal effect and result set forth in the following instructions."

9. Said Supreme Court of the State of Washington erred in sustaining the following instruction given to the jury by the said Superior Court of Snohomish County:

"You are further instructed that under the law which governs this case, even though you should find that Vance H. Thoms was guilty of contributory negligence and did not himself use due care, this

fact alone would not necessarily prevent the plaintiff from recovering a verdict at your hands if the defendant was negligent in one or more of the respects alleged.

389 "In other words, even though Vance H. Thoms did not himself use due care, such is not of itself a complete bar to plaintiff's recovery if the fair preponderance of the evidence establishes that the defendant was guilty of negligence in any one or more of the three manners alleged, and that such negligence directly caused the death of Thoms; but in that case the contributory negligence of Vance H. Thoms, if any, must be allowed by you to have the effect of reducing the damages, if any, found by you to have been sustained by plaintiff in the proportion which his—Thoms'—contributory negligence bears to the combined negligence of himself and the defendant, if you shall find that defendant was negligent."

10. The said Supreme Court of the State of Washington erred in failing to order a new trial in said action and in failing to hold that the said Superior Court of Snohomish County had erred in permitting the witness James McCabe to testify that he had made application to the United States Boiler Inspectors for their report on the accident involved in this action.

11. The said Supreme Court of the State of Washington erred in failing to order a new trial in said action and in failing to hold that the said Superior Court of Snohomish County had erred in permitting the witness James McCabe to testify that a document handed to him was the report of the United States Boiler Inspectors on said accident.

12. The said Supreme Court of the State of Washington erred in refusing to order a new trial of the above action and in failing to hold that the said Superior Court had committed error in refusing a new trial upon the ground of misconduct of counsel as hereinafter stated and in failing to hold that counsel for defendant in error were guilty of prejudicial misconduct in referring during the course of their cross-examination of witnesses of plaintiff in error to the report of the United States Boiler Inspectors regarding the explosion referred to in the complaint herein and particularly in asking the witness Dowling whether said inspectors were wrong in stating positively that there was no indication of overheat on the crown sheet of the engine, and whether said inspectors were wrong if they stated that

390 they could not find a low water mark and there was no evidence of overheat except on the bolt heads, and whether said inspectors were either blind or falsified if they stated "that an examination of the fire-box failed to disclose any line or low water and no evidence of overheat on the crown sheet except around the crown bolt holes where the threads showed a little blue;" and whether said inspectors were wrong when they said this, "And if, as the Great Northern Railway claim this accident was due to low water, we cannot account for the absence of heat on the highest part of the crown sheet and the flumes, which are twenty feet long, the top rows of which must have been entirely exposed if the water was low enough to uncover the sheet within one row of crown stays at the back end;" and whether said inspectors knew what they were

talking about if they said: "Therefore, we are of the opinion that this is not a low water failing but a failure due to the buttonheads being exposed to the engine's heat of the oil fire and the life or strength burned out of them, allowing the heads to pull off."

13. That the said Supreme Court of the State of Washington erred in denying to the plaintiff in error the right guaranteed and granted to it by the laws of the United States not to have the said report of said United States Boiler Inspectors used upon the trial of said action in any manner or for any purpose whatever.

Respectfully submitted,

E. C. LINDLEY,
Attorneys for Plaintiff in Error.
F. V. BROWN,
F. G. DORETY,
Of Counsel.

394 Filed in Supreme Court of Washington Mar. 9, 1916. C. S. Reinhart, Clerk.

In the Supreme Court of the State of Washington.

No. 12500.

ADALINE DONALDSON, as Administratrix of the Estate of Vance H. Thoms, Deceased, Respondent and Defendant in Error,

vs.

GREAT NORTHERN RAILWAY COMPANY, a Corporation, Appellant and Plaintiff in Error.

Bond on Writ of Error.

Know all men by these presents that we, the Great Northern Railway Company, as principal, and the National Surety Company, as surety, are held and firmly bound unto Adaline Donaldson, as administratrix of the Estate of Vance H. Thoms, Deceased, in the sum of \$17,000.00, to be paid to the said Adaline Donaldson, her successors or assigns for the payment of which well and truly to be *paid* we bind ourselves, our, and each of our, successors jointly and severally by these presents.

Scaled with our seals and dated this 8th day of March, 1916.

The condition of the foregoing obligation is that, whereas, the above named appellant as plaintiff in error has prosecuted a writ of error from the Supreme Court of the United States to reverse the judgment rendered in the above entitled action by the Supreme Court of the State of Washington,

Now therefore, if the above named plaintiff in error shall prosecute said writ of error to effect, and answer all costs and damages if it shall fail to make good its plea and shall abide by the judgment of said Supreme Court of the United States and of the said Supreme

Court of the State of Washington as finally rendered, then this obligation shall be void; otherwise it shall remain in full force and effect.

GREAT NORTHERN RAILWAY COMPANY,
By F. G. DORETY, *Its Attorney*,
[SEAL.] NATIONAL SURETY COMPANY,
By (Signature uncertain), *Resident Vice-President*,
E. N. WELCH, *Resident Assistant Secretary*.

I hereby approve the foregoing bond and surety this — day of March, A. D. 1916.

GEO. E. MORRIS,
*Chief Justice of the Supreme Court
of the State of Washington.*

392 Filed in Supreme Court of Washington Mar. 14, 1916. C. S. Reinhart, Clerk.

In the Supreme Court of the State of Washington.

No. 12500.

ADALINE DONALDSON, as Administratrix of the Estate of Vance H. Thoms, Deceased, Respondent and Defendant in Error.

VS.

GREAT NORTHERN RAILWAY COMPANY, a Corporation, Appellant and Plaintiff in Error.

Citation.

UNITED STATES OF AMERICA, ss:

To Adaline Donaldson, as Administratrix of the Estate of Vance H. Thoms, Deceased, Greeting:

You are hereby cited and admonished to be and appear at the Supreme Court of the United States, at Washington, D. C., within sixty (60) days from the date hereof, pursuant to a writ of error filed in the Clerk's Office of the Supreme Court of the State of Washington, wherein the Great Northern Railway Company is plaintiff in error, and you are defendant in error, to show cause, if any there be, why the judgment rendered against the said plaintiff in error, as in the said writ of error mentioned, should not be corrected, and why speedy justice should not be done to the parties in that behalf.

Witness the Honorable George E. Morris, Chief Justice of the Supreme Court of the State of Washington, this 9th day of March, A. D. 1916.

GEO. E. MORRIS,
*Chief Justice of the Supreme Court of the
State of Washington.*

Attest:

[Seal of the Supreme Court, State of Washington.]

C. S. REINHART, *Clerk*.

393 [Endorsed:] No. 12500. In the Supreme Court of the State of Washington, — County. Adaline Donaldson, as Administratrix of the Estate of V. H. Thoms, Deceased, Respondent and Defendant in Error, v. Great Northern Railway Company, a corporation, Appellant and Plaintiff in Error. Citation. F. V. Brown, Attorney for —, 302 King Street Passenger Station, Seattle, Washington.

Service of the within citation upon Adaline Donaldson, as Administratrix of the Estate of Vance H. Thoms, Deceased, the respondent and defendant in error named in said citation, and upon the undersigned as attorneys for said respondent and defendant in error is hereby acknowledged this 13th day of March, 1916, at Seattle, Wash.

HIGGINS & HUGHES AND
JAMES McCABE,

Attorneys for Respondent and Defendant in Error.

394 In the Supreme Court of the State of Washington.

No. 12500.

ADALINE DONALDSON, as Administratrix of the Estate of Vance H. Thoms, Deceased, Respondent,

v.

GREAT NORTHERN RAILWAY COMPANY, Appellant.

Clerk's Certificate.

I, C. S. Reinhart, Clerk of the Supreme Court of the State of Washington, hereby certify that the above and foregoing is a full, true and correct transcript of so much of the record in the above entitled cause as I have been directed by plaintiff in error to transmit to the Supreme Court of the United States.

And I further certify that, in accordance with the Writ of Error herein filed, I now transmit said transcript, together with the original Writ of Error and the original Citation, to the Supreme Court of the United States.

In testimony whereof I have hereunto set my hand and affixed my official seal at Olympia this 26th day of April, 1916.

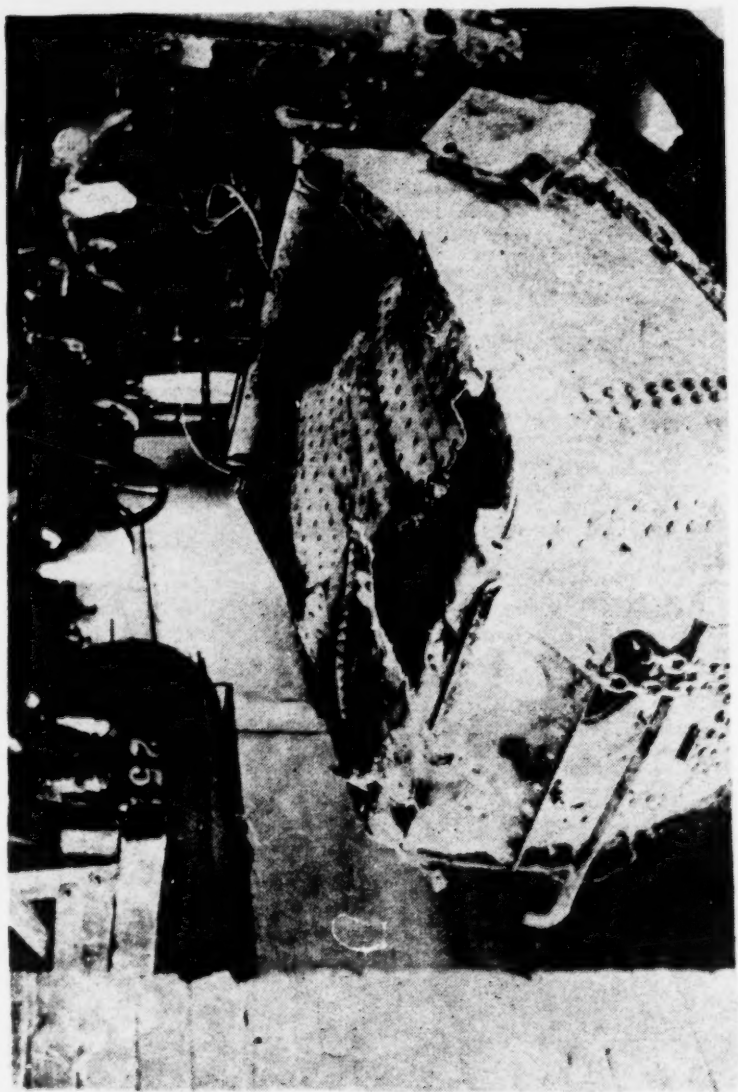
[Seal of the Supreme Court, State of Washington.]

C. S. REINHART,

Clerk of the Supreme Court of the State of Washington.

(Here follow photographs and map marked pages 395 to 419, inclusive.)

Endorsed on cover: File No. 25,306. Washington Supreme Court. Term No. 489. Great Northern Railway Company, plaintiff in error, vs. Adaline Donaldson, as administratrix of the estate of Vance H. Thoms, deceased. Filed May 22d, 1916. File No. 25,306.

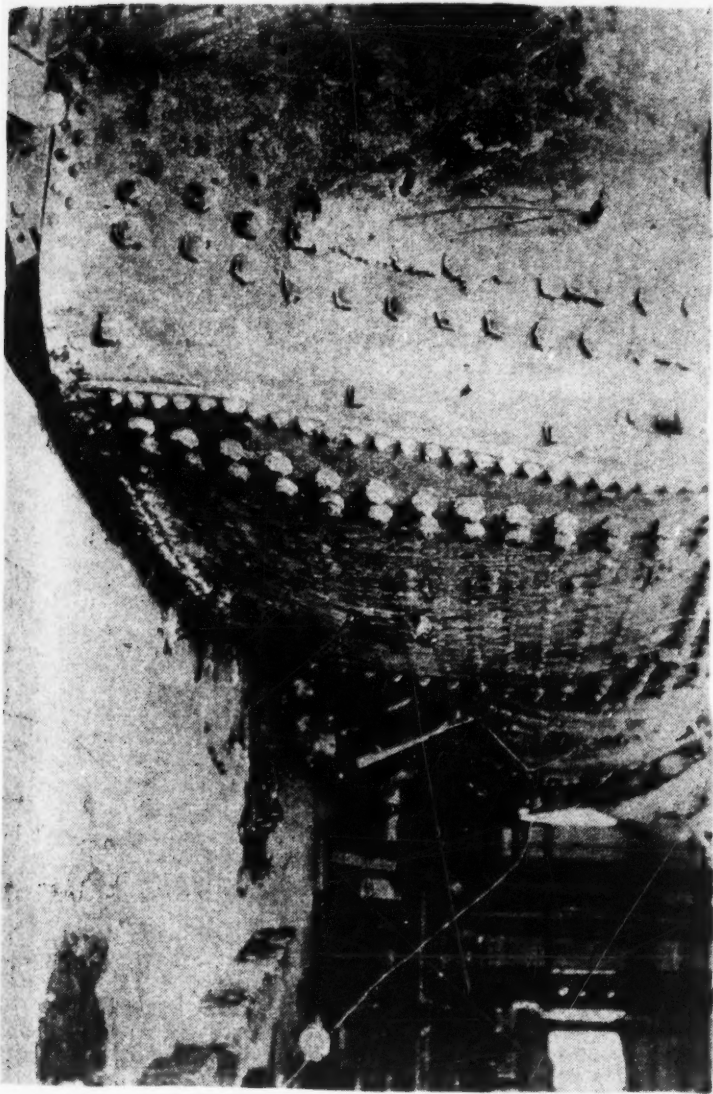


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Taken
June 15, 1914
A. T. H. H. H.
County, Cal.





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by 10. fault

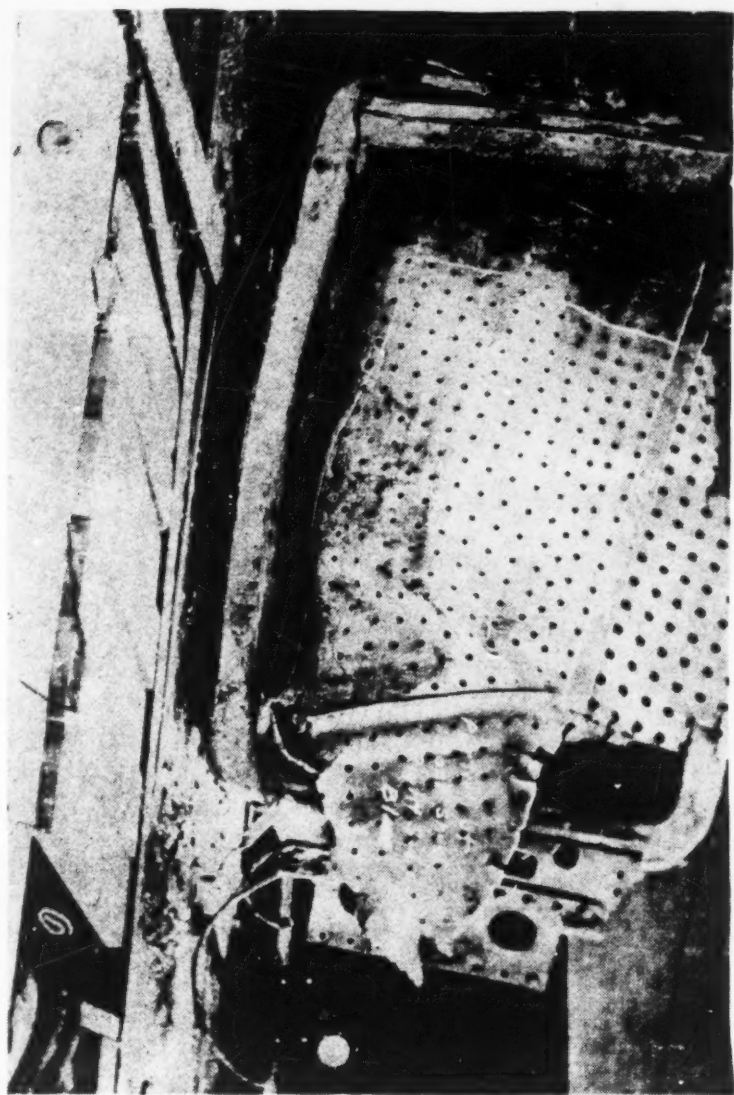
Fossil

June 18 1880

W F. Mearns
County Clerk

396



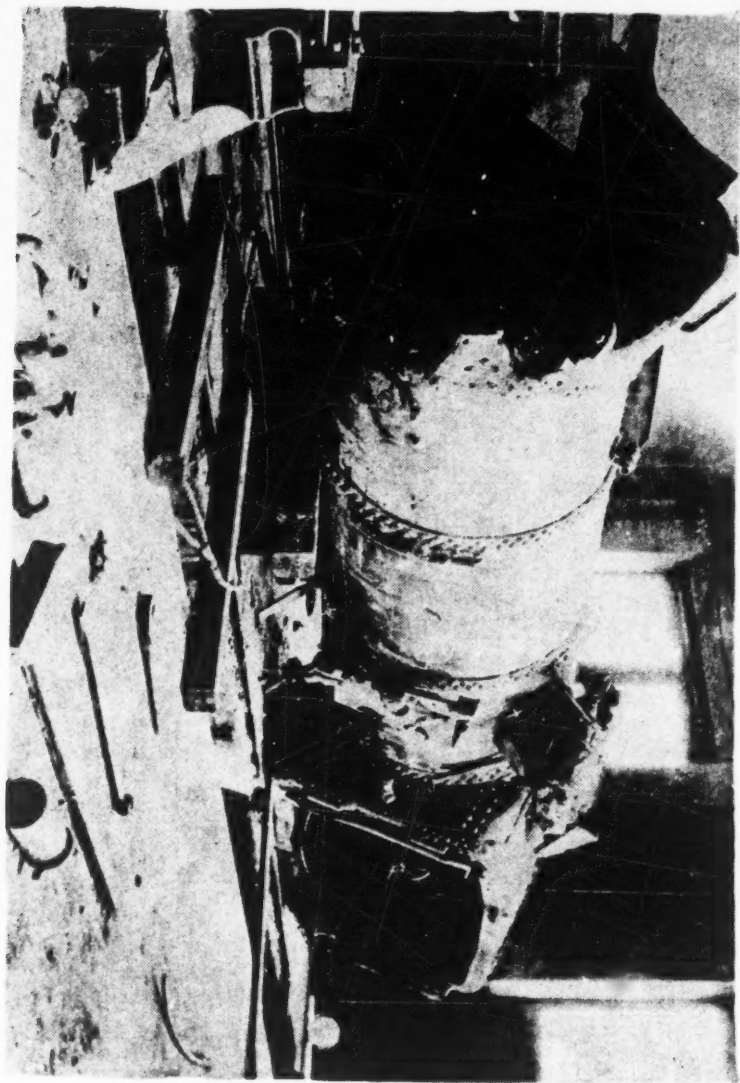


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W. J. Hamilton
County, Cal.

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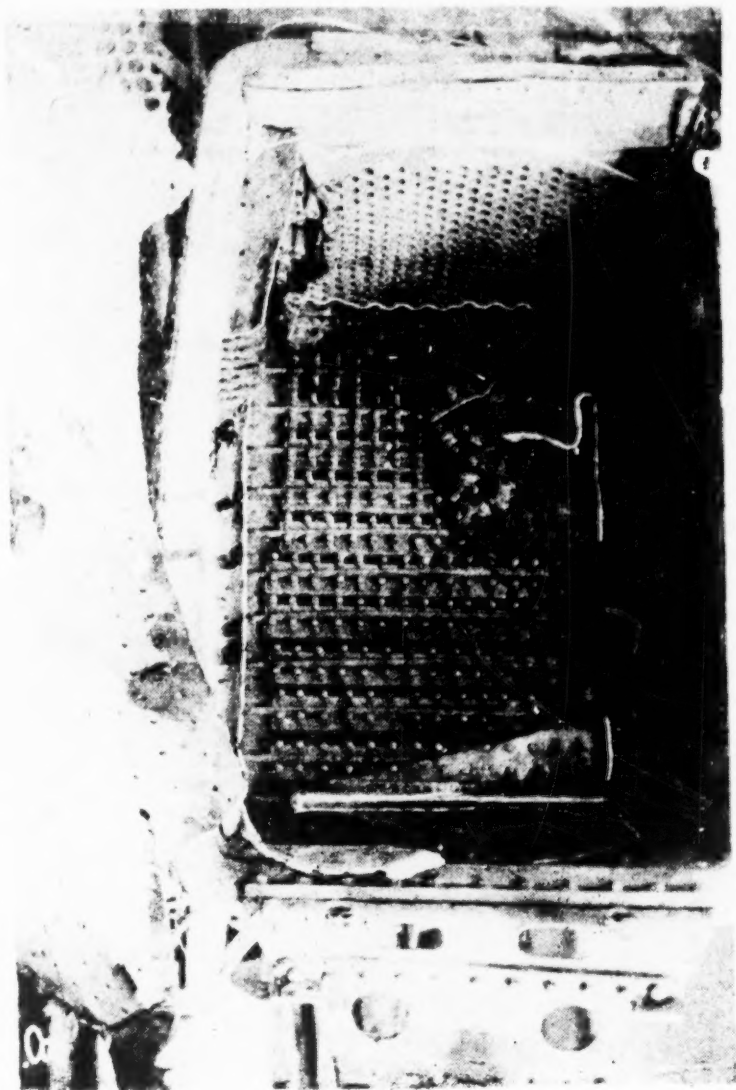
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Dr F. Martin
County Clerk

398





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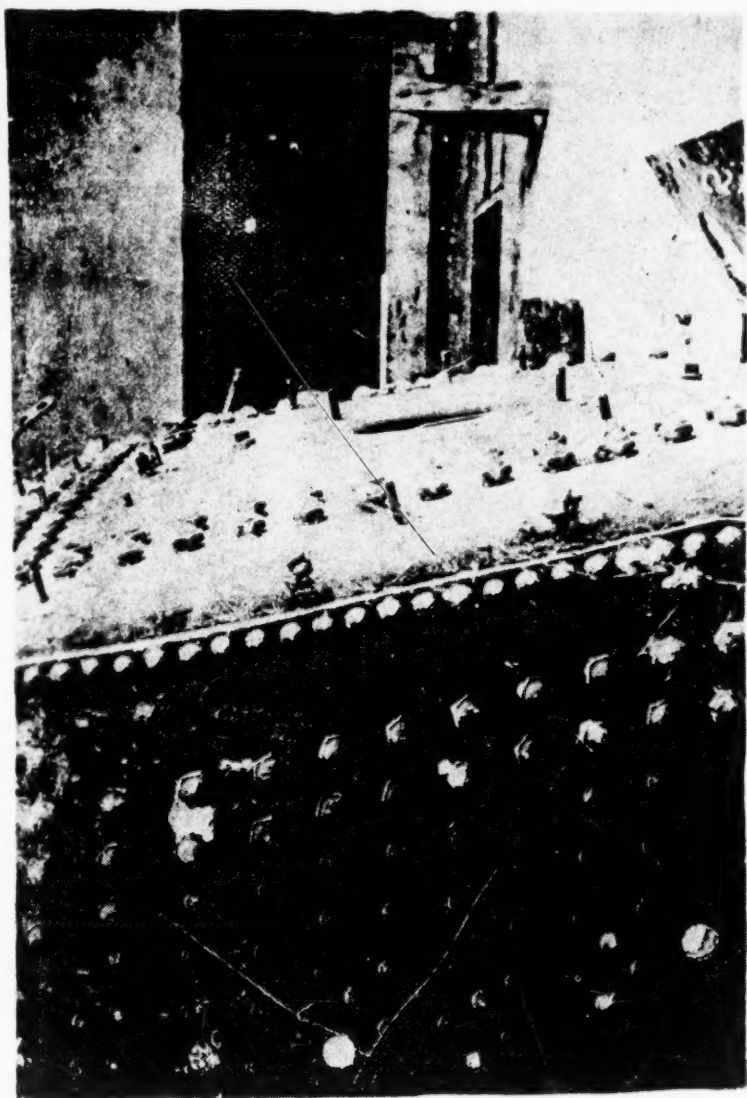
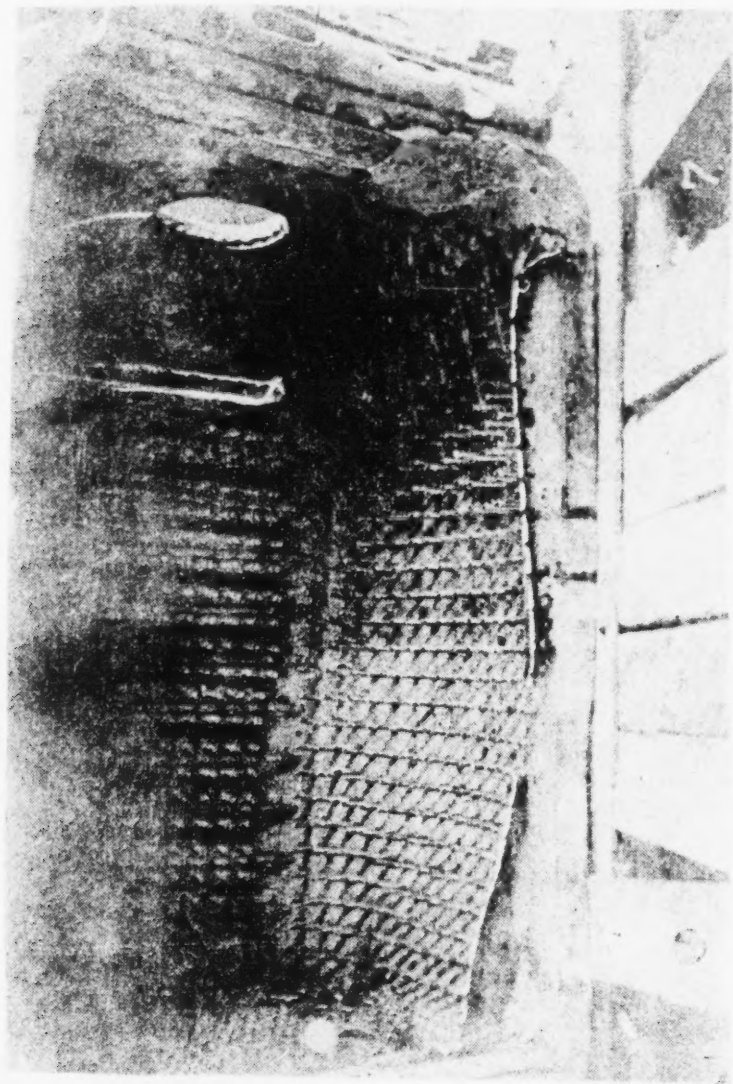


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Dr F. Martin 400
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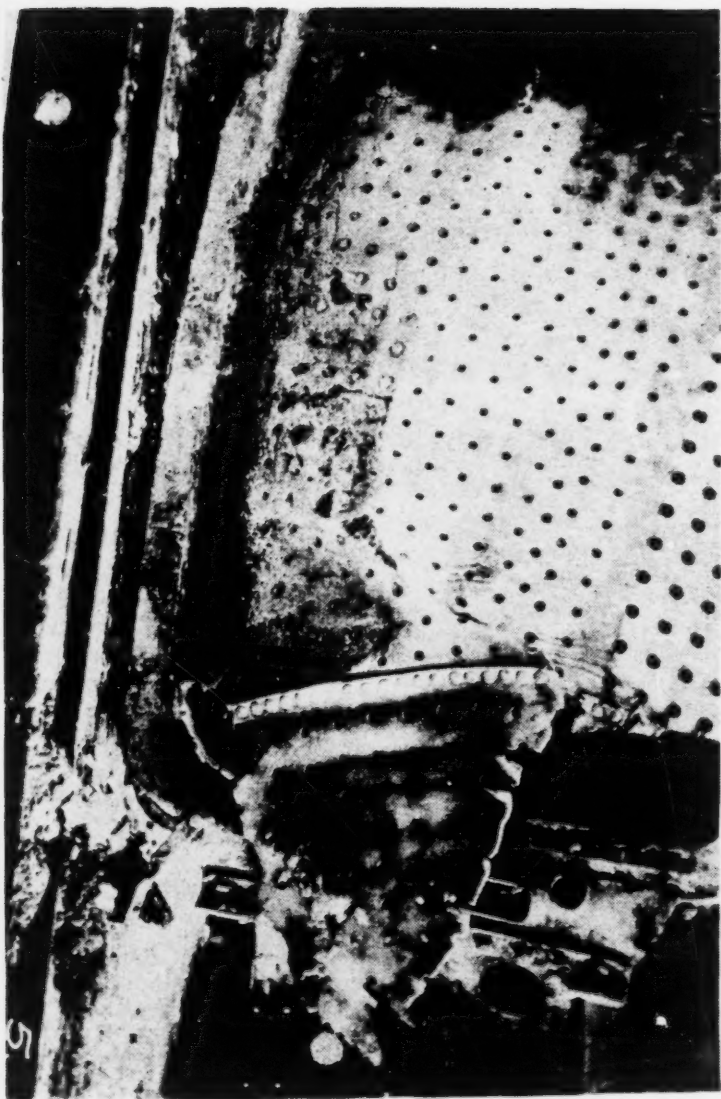


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C. C. Case*

401

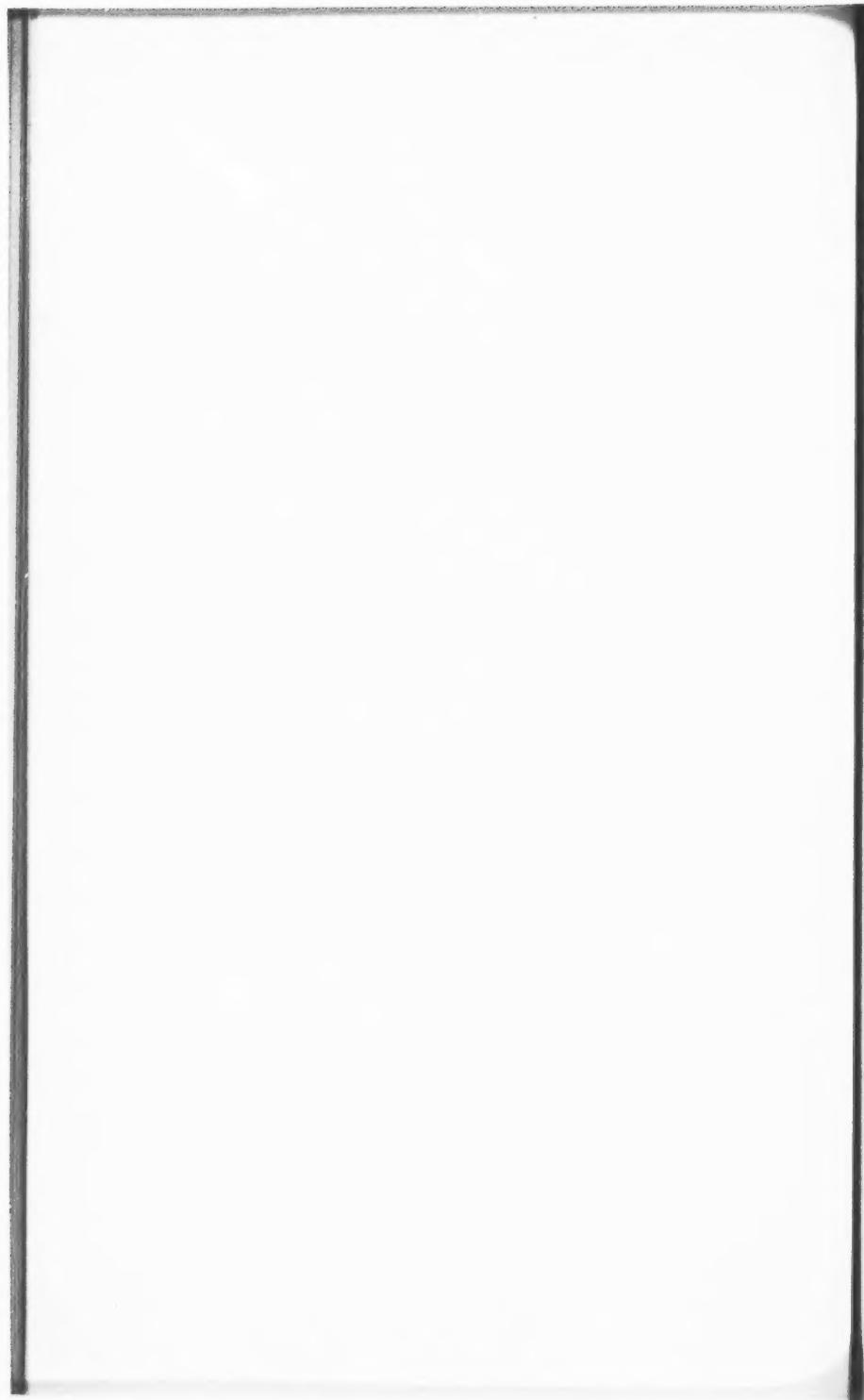


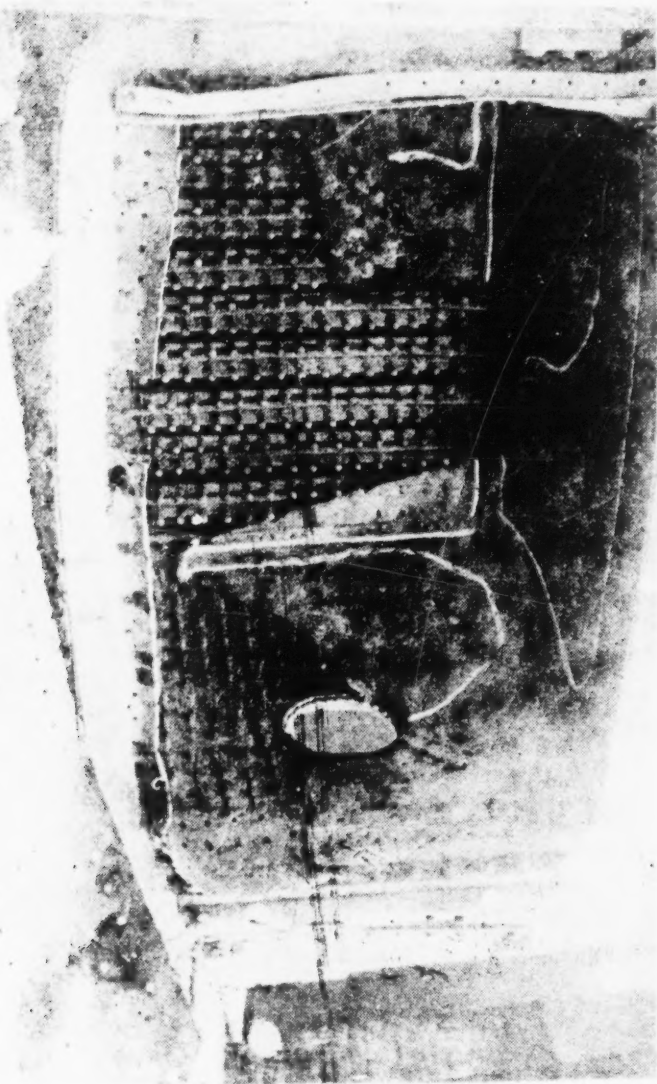


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J. F. Martin
County Clerk

402

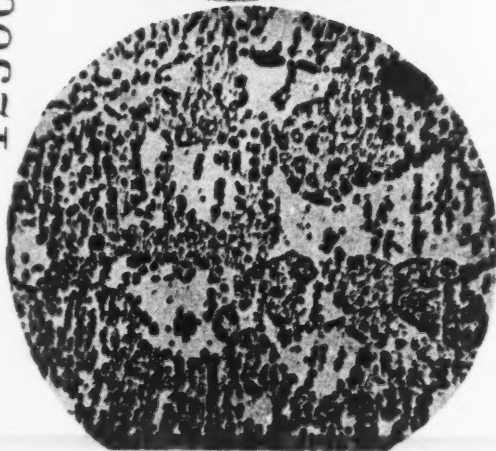




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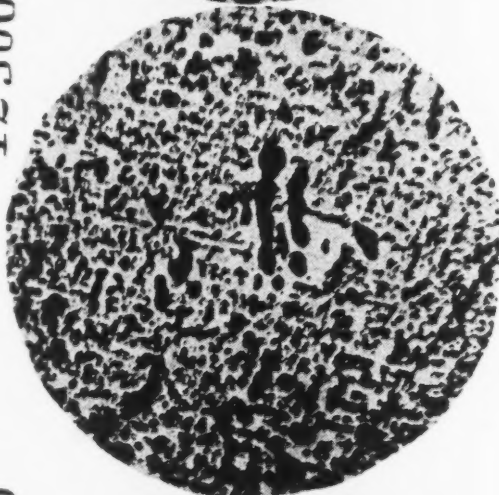
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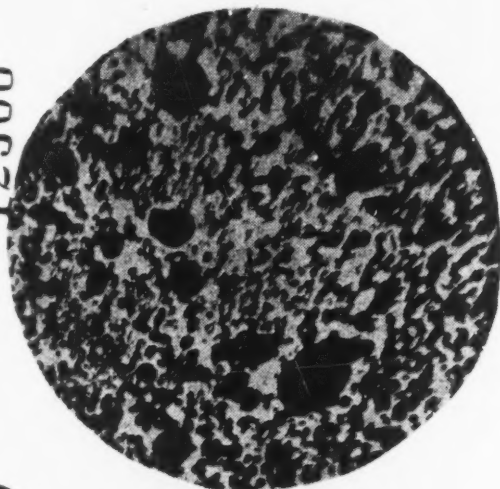
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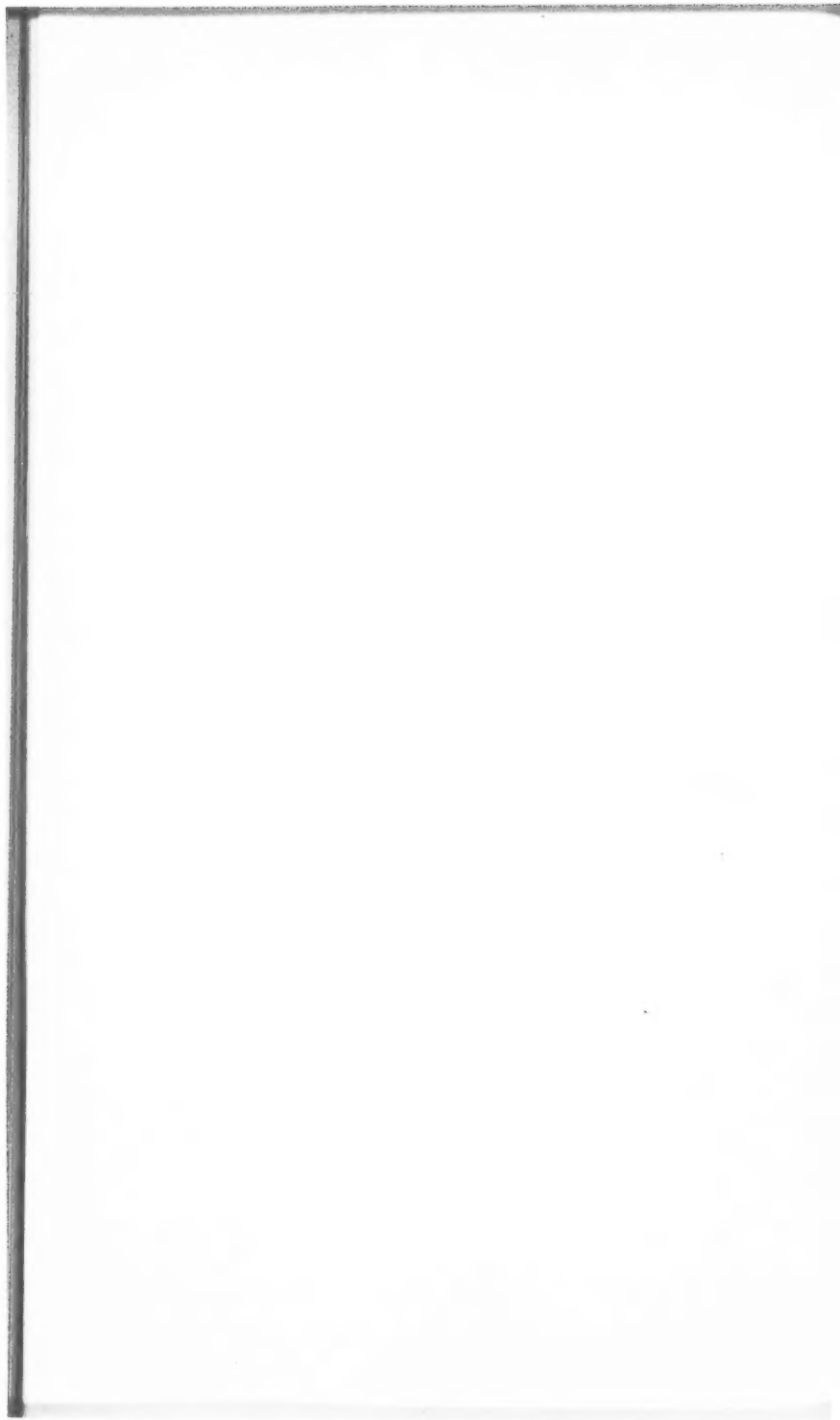
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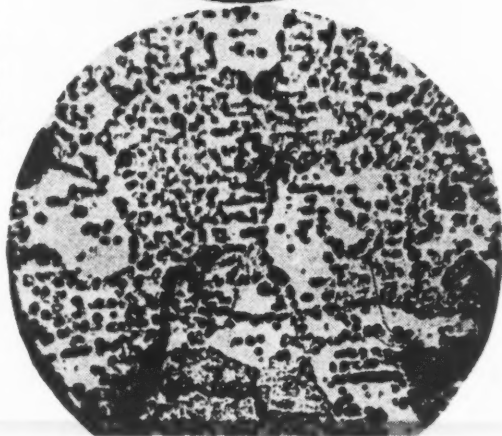


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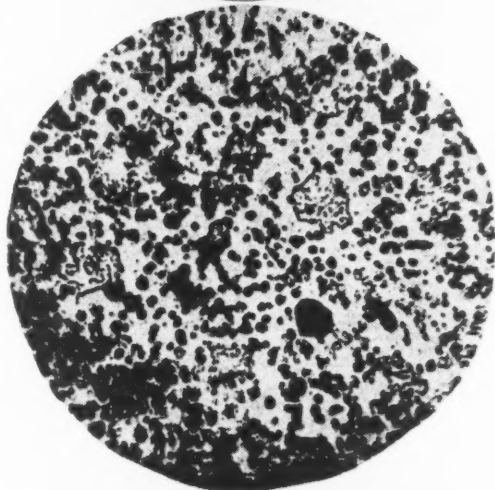
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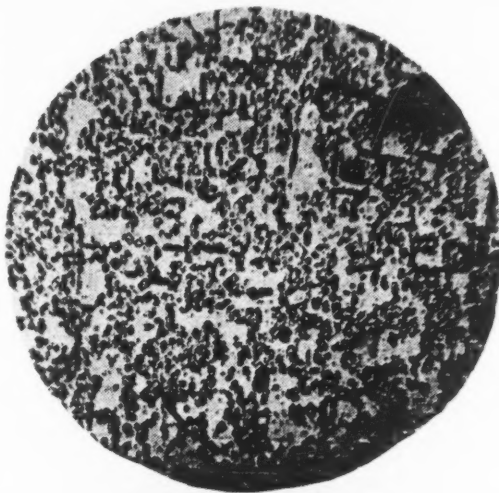
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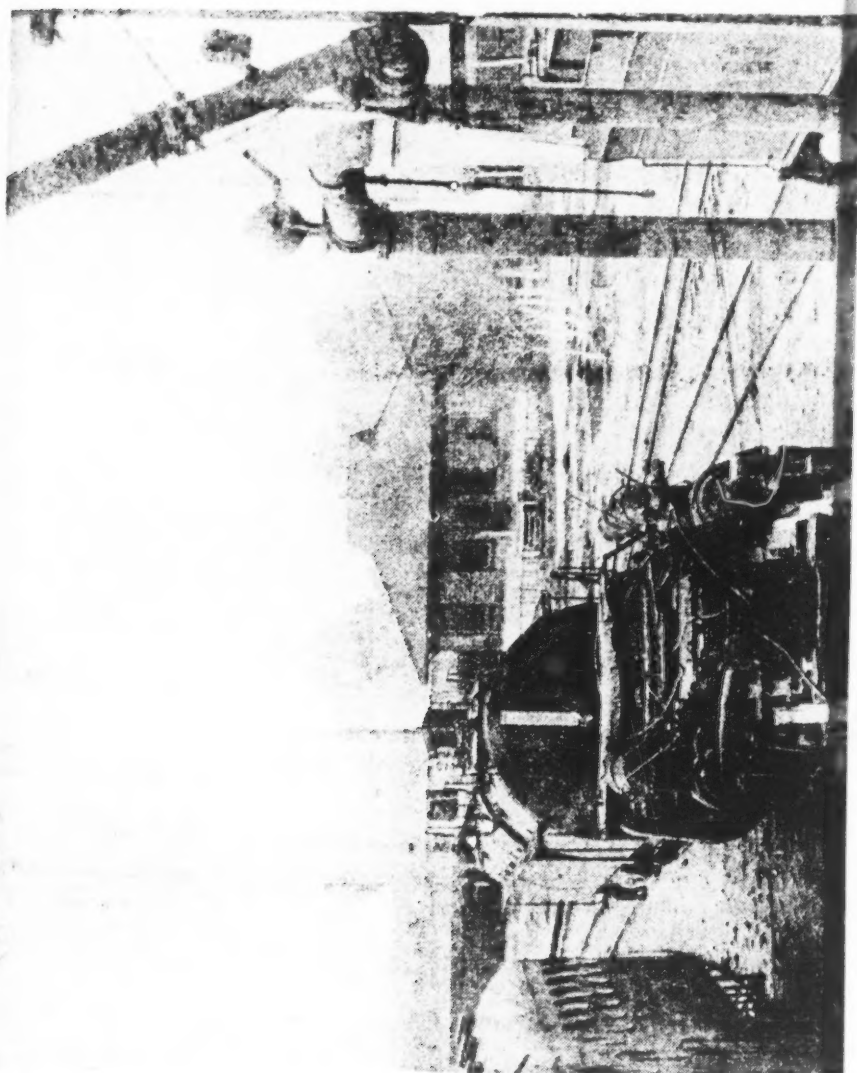
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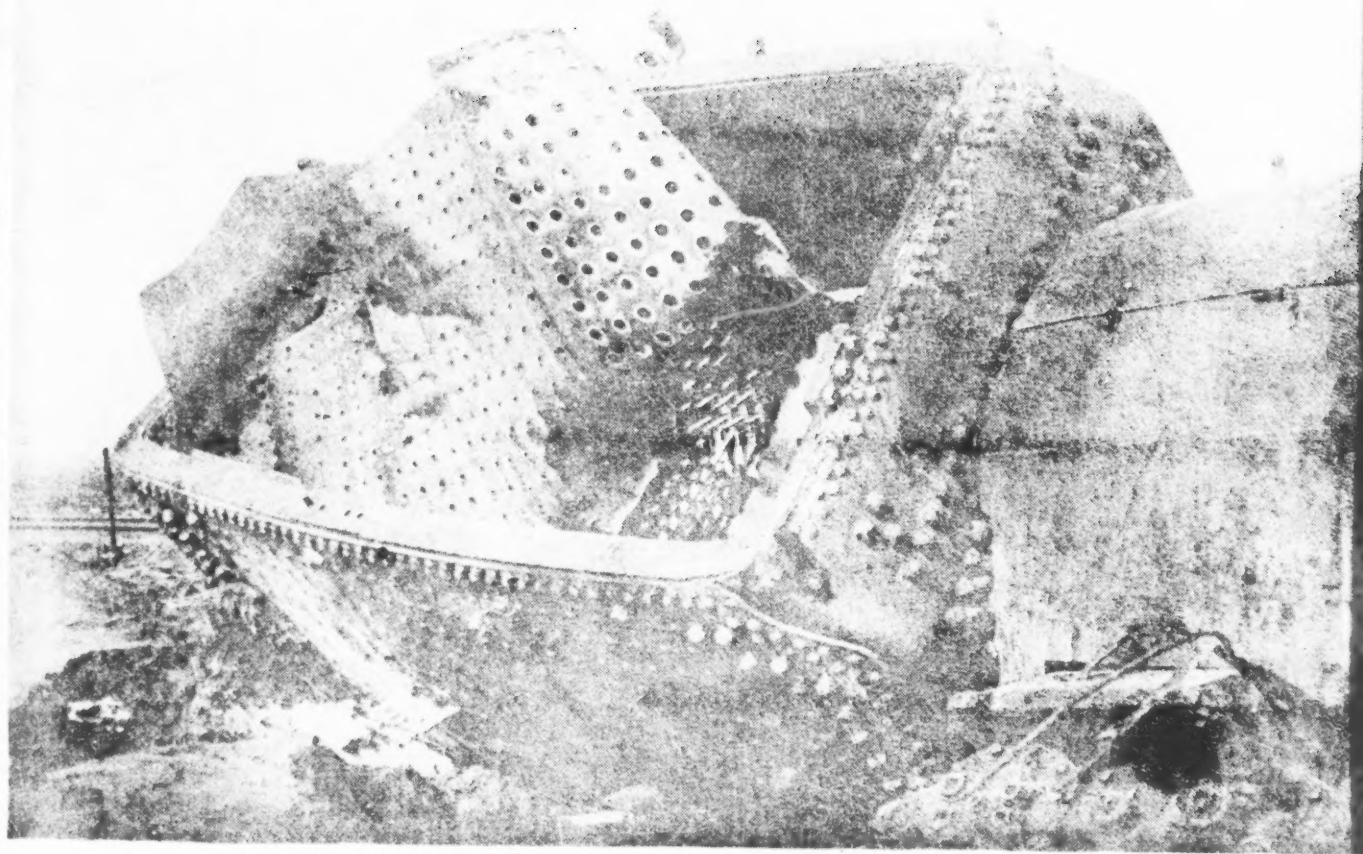
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June 18, 1914

Locke, P. M.

W. V. Maclean

County, Calif



40

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W. F. Warner
Savannah, Ga.



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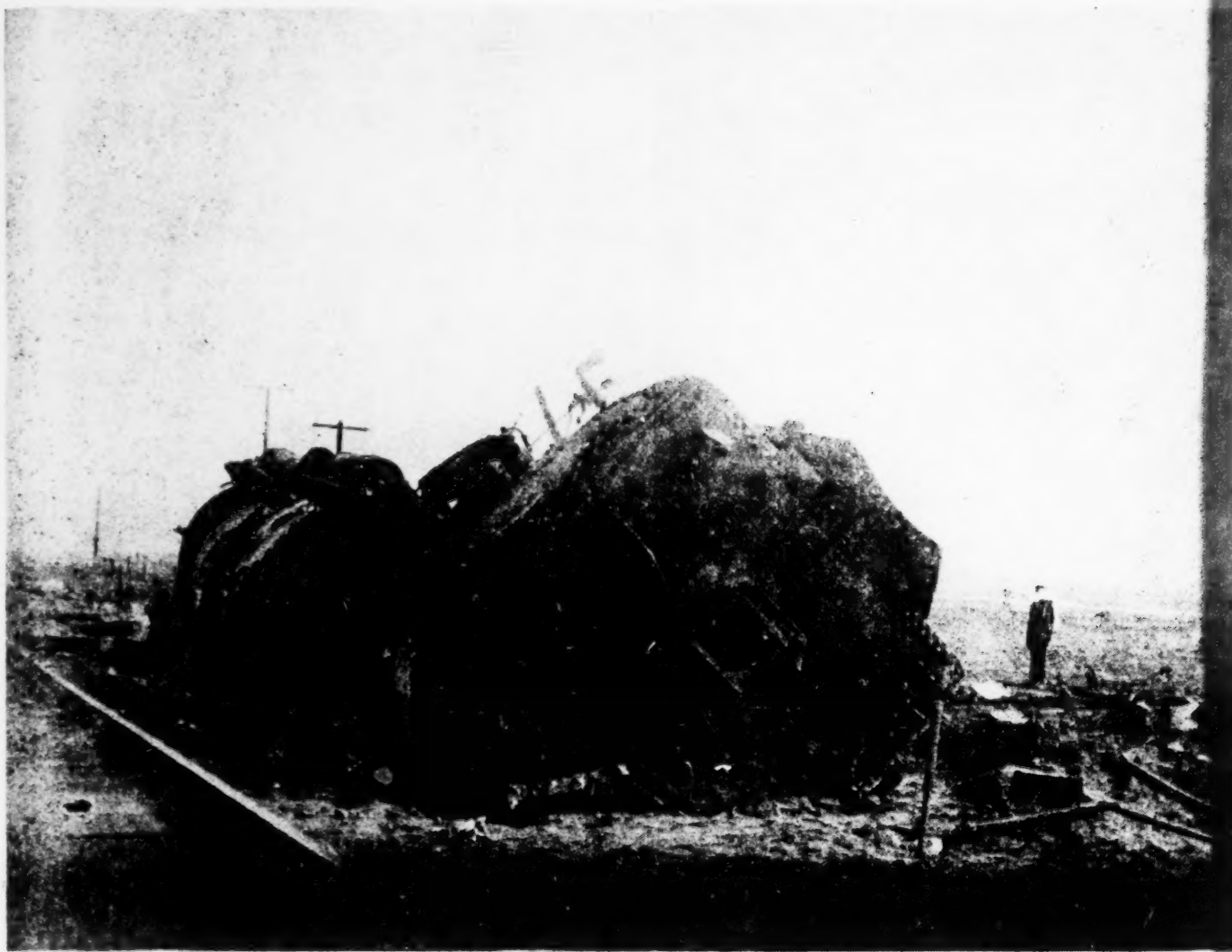
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John

June 18 1914

M. F. Minter
County Clerk



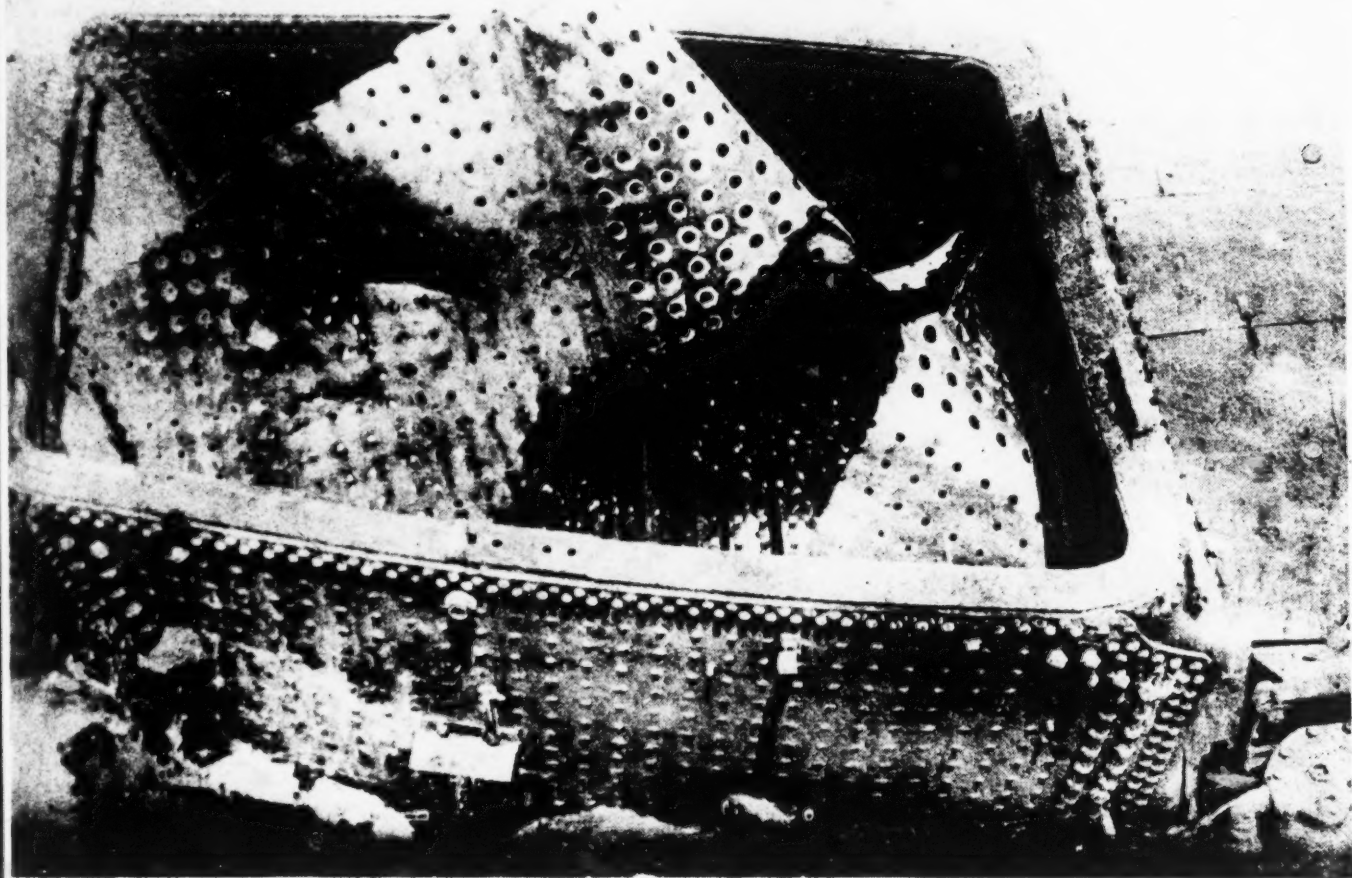
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W. P. Martin
County Clerk



47

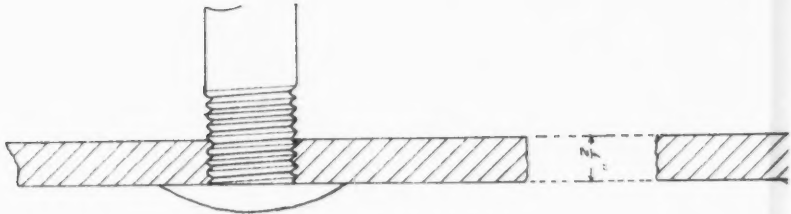
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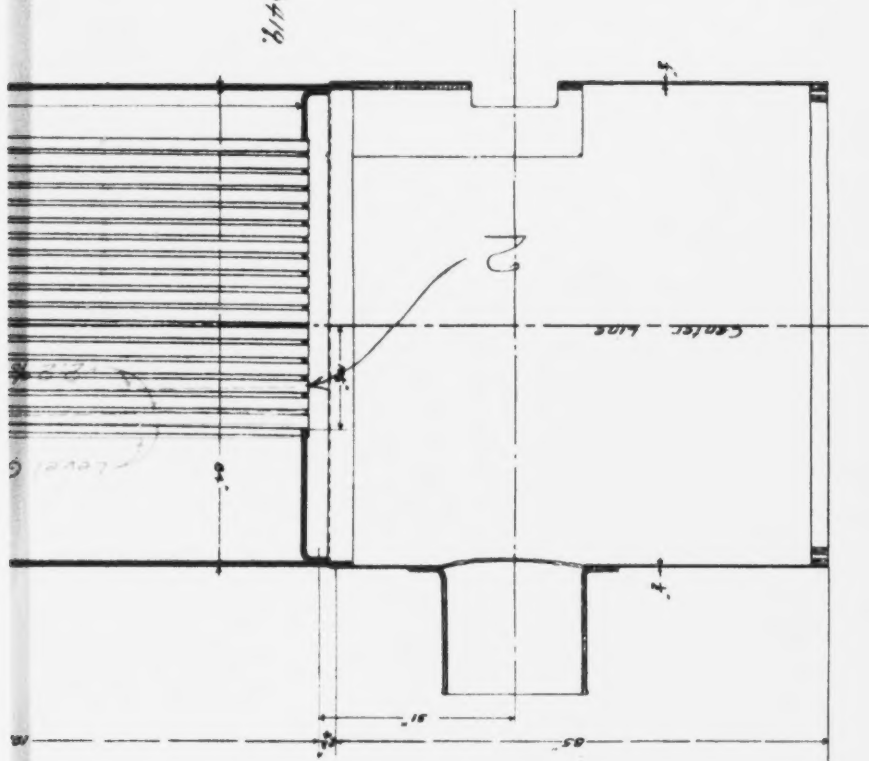
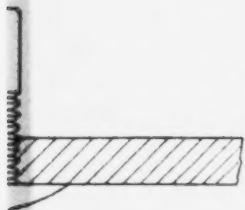
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June 18, 1914
W F Martin
Security Co



No. 489
 Buckle Reel
 Buckle Reel
 419



No. 172

United States Court, D. C.

FILED

DEC 14 1917

JAMES D. MAHER,

CLERK.

Supreme Court of the United States

OCTOBER TERM, 1917

GREAT NORTHERN RAILWAY COMPANY,
Plaintiff in Error,
vs.

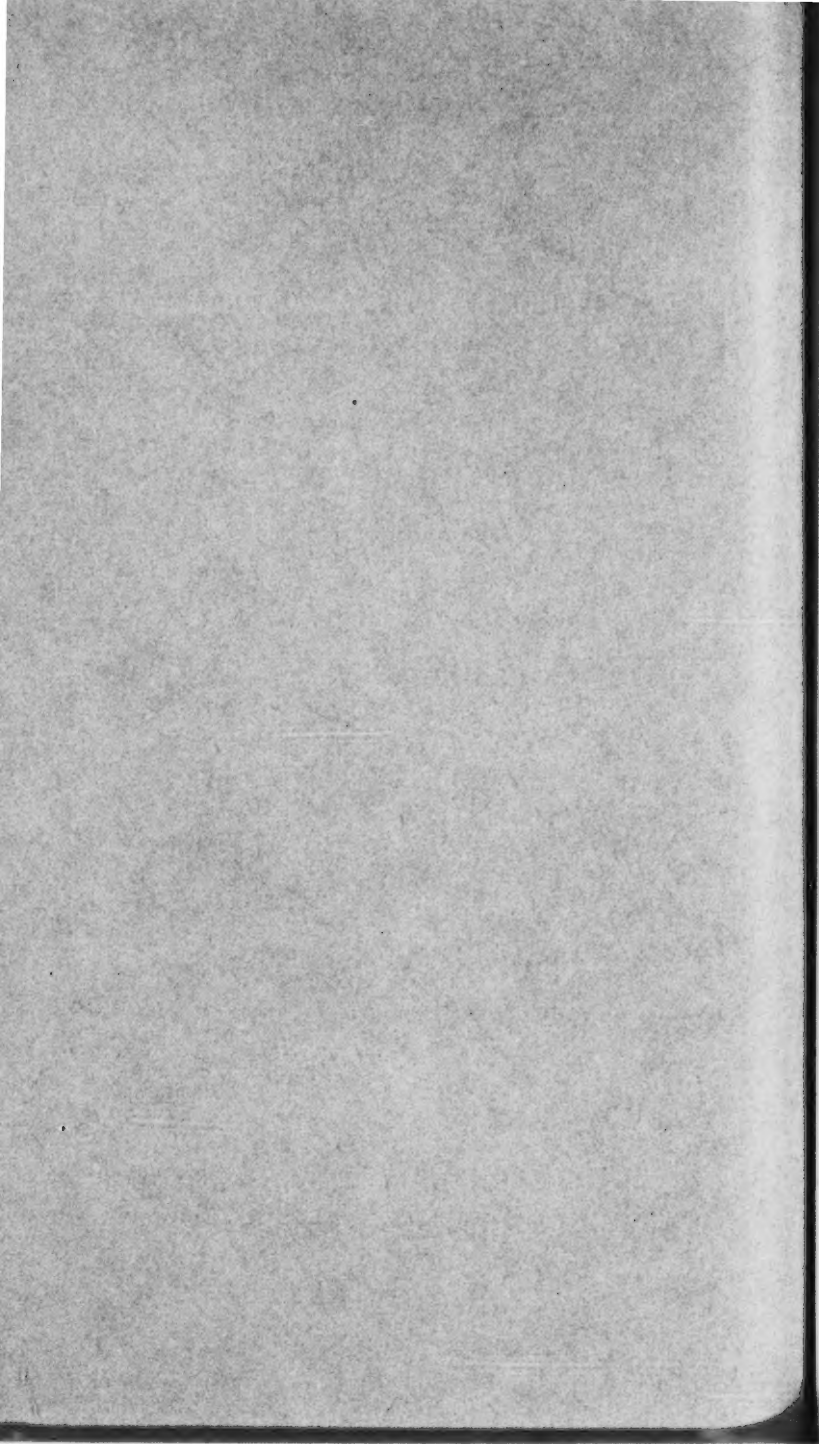
ADALINE DONALDSON, as Administratrix of
the Estate of Vance H. Thomas, Deceased,
Defendant in Error.

In Error to the Supreme Court of the
State of Washington

Brief of Plaintiff in Error

E. C. LINDLEY,
Attorney for Plaintiff in Error.

F. V. BROWN,
F. G. DORETY,
Of Counsel.



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Supreme Court of the United States

OCTOBER TERM, 1917

No. 172

GREAT NORTHERN RAILWAY COMPANY,
Plaintiff in Error,
vs.

ADALINE DONALDSON, as Administratrix of
the Estate of Vance H. Thomas, Deceased,
Defendant in Error.

In Error to the Supreme Court of the
State of Washington

Brief of Plaintiff in Error

STATEMENT OF THE CASE.

This action is brought here on writ of error to the Supreme Court of the State of Washington, to review their decision affirming a judgment of the Superior Court of Snohomish County, in that state, entered on a verdict of the jury for \$8,500.00, in favor of the plaintiff below. The action was brought to recover damages for the death of the

plaintiff's intestate, a locomotive engineer, employed by the Great Northern Railway Company, who was killed by the explosion of the boiler of his locomotive, while assisting to haul an interstate freight train, in the State of Washington.

In paragraph 2 of her amended complaint, the plaintiff specifically elects to sue under the Federal Employer's Liability Act, of April 22, 1908, Ch. 149 (35 Stat. at L. 65). The plaintiff also invokes the Federal Boiler Inspection Act of February 17, 1911, Ch. 103 (36 U. S. Stat. at L. 913), which makes it unlawful for a carrier to use a steam locomotive in interstate commerce unless the boiler is "in proper condition and safe to operate." It was alleged that the locomotive boiler in question was insufficient and defective, in that it was improperly constructed, and that scale had been allowed to accumulate within it.

The trial court gave certain instructions, based on its interpretation of the Liability Act and of the Boiler Inspection Act, covering questions of assumption of risk, and contributory negligence, which were duly excepted to, but were sustained by the State Supreme Court, and which we deem erroneous construction of the statutes in question, and we desire to present these matters for review. We

also contend that the plaintiff failed to offer any proper evidence of certain facts which, by the terms of the Liability Act, are prerequisites to a finding of liability, and that the state courts erred in refusing to grant our motion for judgment notwithstanding the verdict, and to enter judgment in our favor, on the ground of insufficiency of evidence (Tr. p. 224). And finally, we contend that by reason of certain misconduct on the part of counsel for respondent, in referring, upon the trial, to the report of the federal boiler inspector, in violation of the terms of the Boiler Inspection Act, and by reason of the failure of the state courts to order a new trial on this account, we were denied the protection provided for by that act.

SPECIFICATIONS OF ERROR.

1. The Supreme Court of the State of Washington erred in holding that there was any evidence of a defect in the defendant's locomotive due to its negligence and contributing to cause the explosion of said locomotive, and in failing to dismiss the action on that ground.

2. Said court erred in failing to hold that a mere difference of engineering opinion, as to the best type of mechanical construction, is not a basis for a finding of negligence and in failing to find that there was no other evidence of negligence in this record, and that the action should accordingly be dismissed.

3. Said court erred in failing to hold that the doctrine of *res ipsa loquitur* was not applicable in this action and that, there being no evidence of negligence, the action should be dismissed.

4. Said court erred in failing to hold that it was conclusively shown by the conceded physical facts and the undisputed natural laws applicable thereto, that the explosion in question was caused entirely by the negligence of the deceased engineer in allowing the water in the boiler to become too low, and in failing to dismiss the action upon that ground.

5. Said court erred in refusing to instruct the jury as requested by the plaintiff in error as follows:

“You are instructed that even where an employer, such as a railroad company, is negligent in the construction or maintenance of its tools or equipment, such as a locomotive, yet, an employee who accepts, or continues his employment, knowing of the existence of such defects or negligence, and knowing the danger therefrom, assumes the risk of the injury to himself from such defects and cannot recover if he is injured as a result of them. This would not be true in the present case, if the negligence or defects involved some violation of a United States statute, but there is no evidence of any violation of such a statute in this action, so that the rule which I have just given to you would apply in this case. Therefore, even if you find that the defendant company had been negligent in adopting an improper type of bolt, or in failing to install fusible plugs, or in some other particular in the construction or maintenance of this boiler, and even though you should also find that such negligence caused the explosion, still, the plaintiff cannot recover in this action, if you should also find that the deceased, V. H. Thoms, was familiar with the type of construction used, or the particular form of negligence involved, and knew the danger likely to arise therefrom, or if, in the exercise of a reasonable care, he should have known of these things prior to the time of his injury.” (Tr. p. 251.)

6. Said court erred in sustaining the following instruction given to the jury by the Superior Court

of Snohomish County and in failing to order a new trial on account thereof.

“You are instructed that the law provides that it shall be unlawful for any common carrier, as was the defendant, engaged in interstate commerce, to use any locomotive engine propelled by steam power, unless the boiler of the locomotive and appurtenances thereof are in proper condition and safe to operate in the service to which the same is put, that the same may be employed in the active service of said carrier in moving traffic, without unnecessary peril to life and limb; and that no employe shall be deemed to have assumed any risk of death by reason of any locomotive engine operated in violation of said law, and that no employe injured or killed by reason of a locomotive engine operated in violation of said law shall be held to have been guilty of contributory negligence.

“Therefore, if you shall believe, from a fair preponderance of the evidence in the case, that the boiler of the locomotive engine No. 1902 or the appurtenances thereof were not in proper condition and safe to operate in the active service of the defendant in moving traffic without unnecessary peril to life or limb, by reason of the negligence of the defendant, in any one or more of the three respects alleged in the complaint, then and in that case Vance H. Thoms assumed no risk of death and was guilty of no contributory negligence, and the affirmative defenses must fail.

“However, if such boiler and appurtenances were in proper condition and safe for such use in moving traffic, but due to defendant's negligence were defective in one or more

of the respects alleged in the complaint and Vance H. Thoms had actual knowledge of such defect or defects, or such defects were so plainly observable that in the reasonable exercise of his faculties he should have known of such and may be presumed to have known thereof and the dangers that surrounded him, then Vance H. Thoms assumed the risks of injury and the plaintiff cannot recover in this action.

"So, also, if such boiler and appurtenances were in proper condition and safe for such use in moving traffic, but due to defendant's negligence were defective in one or more of the respects alleged, Vance H. Thoms would have been guilty of contributory negligence if he failed to exercise such care and prudence as an ordinary and prudent and careful person engaged in like employment under like circumstances would usually and ordinarily exercise, with the legal effect and result set forth in the following instructions." (Tr. p. 199.)

7. Said court erred in sustaining the following instruction given to the jury by the Superior Court of Snohomish County and in failing to order a new trial on account thereof:

"You are further instructed that under the law which governs this case, even though you should find that Vance H. Thoms was guilty of contributory negligence and did not himself use due care, this fact alone would not necessarily prevent the plaintiff from recovering a verdict at your hands if the defendant was negligent in one or more of the respects alleged.

"In other words, even though Vance H. Thoms did not himself use due care, such is not

of itself a complete bar to plaintiff's recovery if the fair preponderance of the evidence establishes that the defendant was guilty of negligence in any one or more of the three manners alleged, and that such negligence directly caused the death of Thoms; but in that case the contributory negligence of Vance H. Thoms, if any, must be allowed by you to have the effect of reducing the damages, if any, found by you to have been sustained by plaintiff in the proportion which his—Thom's—contributory negligence bears to the combined negligence of himself and the defendant, if you shall find that defendant was negligent." (Tr. p. 200.)

8. Said court erred in failing to hold that the said Superior Court of Snohomish County had erred in permitting the witness James McCabe to testify that he had made application to the federal inspectors who examined this crown sheet for their report on the accident in question; that he had received that report and that the typewritten copy handed to him, which counsel had been using and quoting from in cross-examining one of defendant's witnesses was the report of the Federal Government of this accident that he had received (Tr. p. 168), and in failing to order a new trial on account of said error.

9. The said Supreme Court of the State of Washington erred in refusing to order a new trial of

the above action and in failing to hold that the said Superior Court had committed error in refusing a new trial upon the ground of misconduct of counsel for plaintiff as hereinafter stated, and in failing to hold that counsel for plaintiff (defendant in error) were guilty of prejudicial misconduct in referring, during the course of their cross-examination of witnesses of plaintiff in error, to the report of the United States Boiler Inspectors regarding the explosion referred to in the complaint herein, and in purporting to quote therefrom, and particularly in asking the witness Dowling whether said inspectors were wrong in stating positively that there was no indication of overheat on the crown sheet of the engine, and whether said inspectors were wrong if they stated that they could not find a low water mark, and there was no evidence of overheat except on the bolt heads, and whether said inspectors were either blind or falsified if they stated "that an examination of the fire-box failed to disclose any line of low water, and no evidence of overheat on the crown sheet except around the crown bolt holes where the threads showed a little blue"; and whether said inspectors were wrong when they said this, "And if, as the Great Northern Railway claim, this accident was

due to low water, we cannot account for the absence of heat on the highest part of the crown sheet and the flues, which are twenty feet long, the top rows of which must have been entirely exposed if the water was low enough to uncover the sheet within one row of crown stays at the back end"; and whether said inspectors knew what they were talking about if they said: "Therefore, we are of the opinion that this is not a low water failure but a failure due to the buttonheads being exposed to the intense heat of the oil fire and the life or strength burned out of them, allowing the heads to pull off." (Tr. pp. 165, 166.)

10. That said court erred in failing to hold that the plaintiff in error was denied the protection of the Federal Boiler Inspection Act, which provides that the report of the federal inspectors shall not be used or produced upon the trial for any purpose whatever, and in failing to award to plaintiff in error a trial which should be governed by the provisions of said act, and in denying to the plaintiff in error the right guaranteed and granted to it by the laws of the United States not to have the said report of said United States Boiler Inspectors used upon the trial of said action in any manner or for any purpose whatever.

ARGUMENT.

Error in Denying Motion for Judgment Notwithstanding the Verdict.

SPECIFICATIONS NOS. 1 AND 2.

We shall discuss the question as to the sufficiency of the evidence first, as that will require a summary of the evidence, and it will make for greater brevity and clearness in the discussion of the instructions and the question as to misconduct of counsel, if this summary of the evidence is given first.

The questions as to what constitutes negligence, and casual relation, and whether there is any sufficient evidence to establish them, are questions for this court.

“As the action is under the Federal Employer’s Liability Act, rights and obligations depend upon it, and applicable principles of common law as interpreted and applied in Federal courts.”

Southern Ry. Co. vs. Gray, 241 U. S. 333, 36 S. C. R. 558, 60 L. Ed. 1030.

“The defendant, however, * * * did save the questions concerning * * * the evidence of its negligence, all of which, of course, in a case arising under the act, could be brought to this court.”

Minneapolis & St. L. R. Co. vs. Winters,
242 U. S. 353, 37 Sup. Ct. Rep. 170, 61 Law
Ed. 358.

The Federal Employer's Liability Act makes the carrier liable for an "injury or death, resulting in whole or in part from the negligence of any of the officers, agents, or employes of such carrier, or by reason of any defect or insufficiency due to its negligence, in its cars, engines, appliances," etc. The injury must be "resulting" from "negligence," or from a "defect," "due to its negligence." Therefore the plaintiff is required to offer some evidence (1) that a defect existed at the time of the explosion; (2) that the defect was due to the defendant's negligence; and (3) that such defect was the cause of the explosion.

The complaint alleged three defects as the cause of the explosion: (1) "that the 'button heads' of the crown bolts of said boiler were excessively and unnecessarily large, and consequently unduly exposed to the direct heat produced by the oil fuel used on said locomotive;" (2) "that said boiler was not provided with safety fusible plugs;" and (3) "that scale was negligently allowed by said defendant, its officers and employees, to accumulate upon the crown sheet of said boiler."

Our first contention is that the plaintiff failed to offer any sufficient evidence to sustain any of these allegations.

Most of the record is taken up with conflicting evidence as to whether or not the explosion was caused by low water. The defendant's witnesses testified that the explosion was due to the fact that the deceased engineer had allowed the water to become too low in the boiler, thus permitting the exposed metal to become red-hot and softened, and causing it to give way. The plaintiff offered some evidence to contradict this, and we may assume for the sake of this portion of our argument that this issue was successfully sustained by the plaintiff, and that the explosion was not due to low water. Even assuming this, however, we contend that the plaintiff failed to offer any sufficient evidence as to what *did* cause the explosion, or to sustain any one of her three allegations of negligence.

Plaintiff's Only Evidence Alleges an Improper Design, but Not a Defect.

There was no contention whatever, by any of the plaintiff's witnesses that the lack of a "fusible plug" caused this specific explosion, or that the presence of such a plug would have prevented this

explosion; and there was no evidence that any "scale" had accumulated in the boiler *at the time of the explosion*, or that the explosion was due to scale. And as to the third charge of negligence, in using the "button head" crown bolts, the complaint does not allege any "defect" in these, in the sense that they were out of repair, but simply that we adopted an improper design or type of construction for an oil burning engine, in making the bolt heads too large for an oil flame. Two of the plaintiff's experts failed to express any opinion that the use of these bolts caused the explosion—or to connect them with the explosion in any way—while the third expert (and the only one of the plaintiff's witnesses who expressed any opinion whatever as to what did cause the explosion) simply testified, in line with the allegation of the complaint, that the disaster was due, not to any defect or want of repairs, but to the *design* of the boiler, and to the *type* of bolts used. And it will be our contention that under the decisions of this court a mere difference in engineering opinion in the adoption of a mechanical standard of construction is not sufficient to warrant a jury in finding the existence of a "defect," due to "negligence," within the meaning of the Federal Act.

The construction of the engine, and the design of these "button heads" will require some explanation before we discuss the testimony.

The crown sheet is the top or roof of the fire box, and forms the bottom of the water compartment over the fire box. It is suspended from the top of the boiler, by bolts, spaced four inches apart, each way, called "crown bolts." On the lower end of these bolts, to hold up the crown sheet on the engine in question, were round button shaped heads, which are the "button heads" referred to in the complaint. A diagram of the cross section of this boiler is shown on Exhibit A, a reduced copy of which is folded and attached next to the back cover of the printed transcript of record. The size and shape of the button head is shown by diagram marked 1 on the original exhibit.

These bolt heads are studded over the lower side of the crown sheet, and exposed to the flame in the fire box. The use, by defendant, of button head bolts upon the engine in question, and the exact dimensions of the heads, and also the fact that oil was used as fuel, were shown—and admitted—and the plaintiff offered expert testimony to prove that these bolt heads were of an undesirable type, in that they were too large, and con-

tained too much metal, to stand the excessive heat of an oil burning flame, and that they would tend to become crystallized and weakened, and finally to give way and cause an explosion of the boiler. A very much smaller type of bolt head, marked 3 on the diagram, and referred to as the "taper head," was recommended for oil burning engines, as less subject to this danger. But with the one exception already mentioned, there was no testimony that the explosion in question was due to this cause, or that the bolt heads in this engine had actually become crystallized at the time of the explosion.

The one exception above referred to, occurs upon our cross-examination of the witness J. C. Pierron. He had expressed the opinion that our bolt heads, while the best type for a coal burning engine, were too large, and would *tend* to crystallize and burn off, in an oil flame, and that people would get scalded. (Tr. p. 47.) But, like the other witnesses, on his *direct* examination, he was not asked and did not testify, as to how far this *tendency* had progressed, or whether the bolt heads upon the engine in question had actually become crystallized *at the time of the explosion*, or as to whether, in his opinion, the explosion resulted from any such cause. On cross-examination, however, he stated (and this is absolutely the only shred of evidence to this effect

in the entire record) that he thought the explosion was due to the use of the large button heads in an oil flame. The question now is, whether, upon the strength of his opinion so expressed, a jury can make a finding of negligence within the meaning of the Federal Act.

In order to determine this, we must first discover just what his theory was. The evidence presented by Mr. McGrath and Mr. McCabe, the plaintiff's other experts, had been that the expansion and contraction of the crown sheet caused by the excessive heat of the oil flame would cause the bolts and bolt heads to tip slightly, leaving a very small opening between the crown sheet and the bolt head, and that a film of air or gas would form in this opening, and insulate the bolt head from the cooling effect of the water. This would cause the metal ultimately to become overheated and crystallized and lose its strength, but only after the expanding of the crown sheet had paved the way, by allowing insulation to form.

Mr. Pierron, however, held to a somewhat different theory from the plaintiff's other experts. He "don't understand" the insulation theory of Mr. McGrath's. He had never "had time to fathom out" Mr. McGrath's idea that where larger heads

were used, the head of the bolt would separate from the crown sheet, and let gas into the opening, which would insulate the bolt head, and cause it to over-heat and crystallize. It is "recognized among boiler-makers that the fact is just the contrary. * * * " (Tr. p. 53.)

Mr. Pierron's theory, if we follow it correctly, is that the explosion was due *directly to the amount of metal used in the bolt heads*, and to the effect of the oil flame directly on that metal, or in other words, to the *standard of mechanical construction* adopted by the defendant's mechanical engineers, and not to the fact that the metal had become crystallized or deteriorated by prior use. While the other witnesses stated that the *quantity* of metal in the bolt heads was responsible, only as it had produced an inferior or weakened *quality*, during prior use, this witness seems to think that the *quantity* itself, regardless of deteriorated *quality*, would cause the explosion.

It is true, Mr. Pierron testified that in his opinion, the bolt heads had become crystallized at the time of the explosion, but he also testified that the bolts, when crystallized, had the same strength as when new. "The crystallized would probably stand as much strain as the new." (Tr. p. 54.)

It is also true that he testified, "the crystallization, that caused them to come down and then the heat on the bolt head caused them to fail," and "I was assuming that the bolts would be crystallized any time any of them failed." (Tr. p. 55.) But he was then asked: "Are you making any deduction that the bolts on this engine were crystallized or not?" and answered: "I would not *swear* they were *crystallized*; they have been *overheated*. * * *

(Italics ours.)

"Q. Then you don't want the jury to understand that the bolts or the heads had been permanently weakened in any manner—I mean the metal in them—especially from the fact that they were hot?

A. They generally get weakened on account of expansion and contraction all the while the bolt head itself is in the heat, and it is that way weakened and caked up, filled up where they had been leaking.

Q. Is it or is it not your wish to be understood by the jury that it is your opinion that the bolts which came off this engine and which you have seen were crystallized, or the bolt heads?

A. They were *overheated*.

Q. Is the metal good or isn't it?

A. I want to be understood that they were both ways; they are crystallized and overheated, both ways.

Q. Is all above in the head good now or isn't it?

A. No, it is not."

(Tr. p. 56.)

It will be observed from the above, that while the witness is finally driven to a statement that the metal was crystallized as well as overheated, he does not say that the crystallization caused the explosion. He everywhere reiterates that "they were overheated"; and stated that such large bolt heads would in his opinion and regardless of crystallization, "get red-hot every time an engine goes out on the road." "I don't think you could * * * run an engine with the type of head like the No. 1 bolt here without getting it red-hot with an oil burner."

"Q. Do they get hot enough to lose all their strength?

A. Yes, they surely would. I am not so sure. The oil may be regulated right." Again, he says: "They do not lose all their strength unless they get almost to a white heat, but they have lost some of their strength." (Tr. p. 57.)

In answer to the direct question as to how these bolt heads pulled off, if, as he claimed, they had the same strength when crystallized as when new, he said: "*Because they were hot.*" The metal was "practically fused; *overheated.*" (Tr. p. 54.) His statement that bolts of this size cannot be used at

all in an oil fire, without becoming red-hot, and losing some or all of their strength, and that crystallized bolts are as strong as new ones, and his frank disagreement with the theory of Mr. McGrath, make it perfectly clear that he did not attribute the explosion to crystallization, but directly to the fact that there was too much metal in the bolt head.

We have stated that Pierron is the only witness in the entire case who testified that any of the bolt heads had actually become crystallized. It should be noted, however, that the bolt heads to which he referred *were not produced, and were not shown to have come from the engine in question.* They were in the possession of Mr. McCabe, plaintiff's counsel. We *assumed* that they were from this engine, for we asked: "Could you tell, with a chisel and hammer, from the bolts which Mr. McCabe has in his possession which came off this particular engine, whether or not they were crystallized?" and he replied: "You can see they are." (Tr. p. 55.) But outside of this, there is no showing that they *were in fact* taken from this engine, and *no other evidence in the record that any bolt heads actually taken from this engine were crystallized.*

This Evidence Is Purely Speculative Theory.

It should also be noted that the witness' opinion as to the improper size of these bolt heads, is a pure theoretical speculation, and not the result of any previous observation of similar bolt heads. He had never seen or heard of an explosion caused by the use of an oil flame with the large button heads. (Tr. pp. 57, 58.) His theory is absolutely unsupported by any experience of his own on oil burning engines, or by reports of others. He had seen crown sheets drop when *similar* bolts were used, but always on *coal burners*. (Tr. p. 58.) And on coal burners he considers them the best and strongest type, and least likely to explode. It is the universal practice of all roads to use the large heads always, on coal burners. (Tr. pp. 58, 59.)

Not only had this witness never seen nor heard of an *explosion* on an oil burning engine with this type of bolt, but he had *never seen a bolt head of this size used at all*, on an oil burner. The Milwaukee was the only oil burning road he had ever worked on, except for a month and a half on the Northern Pacific, and he had not seen any button heads used on the oil burners on either road, or on any other road.

“Q. You never saw any other oil burning engines with the button heads?

A. No." (Tr. pp. 51, 53.)

Where he got the idea that they would necessarily become red-hot in an oil flame does not appear, as he never saw one used, and there is neither standard authority, nor experience or observation of any witness, to sustain this opinion.

It is interesting to note in this connection that this very theory of his, that the excessive amount of metal in the bolt head will, of itself, and without any previous deterioration or insulation, cause it to become overheated, when exposed to an oil flame, was tested by applying an oil flame such as is used to melt steel bars, four inches square—the hottest oil flame that could be produced—directly on a bolt head of this same size, with a sheet and water above it, for an hour, and the result was merely to warm it. It could not be made red hot. (Tr. pp. 109, 110.)

*Such Evidence Does Not Show a Defect, or
Negligence.*

Under a well settled rule, which has been recognized by the court, a verdict cannot be based upon a mere difference of engineering opinion as to the type of construction adopted, even though the expert is properly qualified. The adoption of a certain mechanical standard of construction, as the

result of the exercise of engineering skill, is not a "defect," due to "negligence," even though a jury may differ from us upon the engineering question involved. If it were otherwise, we might change our standard bolt to the taper head, to conform to the finding of one jury, and then be convicted by a second jury of negligence in making the change demanded by the first.

"The defendants had to select the kind of machinery they wished in conducting their business. At this day, when inventions of machinery are of daily occurrence, frequently a large number of different kinds are made to accomplish the same purpose, and great difference of opinion exists as to the kind best adapted to the use intended, in the minds of men well skilled in their construction and use. The comparative merits of the different kinds, whether as to safety or utility, are questions most difficult to solve; and to say that it shall be left to a court or jury to determine in any given case which kind a manufacturer shall use, in order to avoid liability in case of an accident to an employe while using it, would be imposing a duty upon the court and an injustice upon the party, alike intolerable."

Richards vs. Rough, 53 Mich. 212, 18 N. W. Rep. 785 and 787.

This decision is cited with approval by this court in *Tuttle vs. Detroit, G. H. & M. Ry. Co.*, 122 U. S. 189, 30 Law. Ed. 1114, where Mr. Justice Bradley said:

"Although it appears that the curve was a very sharp one at the place where the accident happened, yet we do not think that public policy requires the courts to lay down any rule of law to restrict a railroad company as to the curves it shall use in its freight depots and yards, where the safety of passengers and the public is not involved; much less that it should be left to the varying and uncertain opinions of juries to determine such an engineering question."

In the case of *South Pacific Co. vs. Selcy*, 152 U. S. 145, 14 Sup. Ct. Rep. 530, 38 Law Ed. 391, this court held that the following instruction should have been given:

"The jury are instructed that if they find from the evidence that the railroad companies used both the blocked and the unblocked frog, and that it is questionable which is the safest or most suitable for the business of the roads, then the use of the unblocked frog is not negligence, and the jury are instructed not to impute the same as negligence to the defendant, and they should find for the defendant."

In the case just cited, there was conflicting evidence as to the extent of the use, by other railway companies, of the types of frogs advocated respectively by the plaintiff and the defendant, and also a conflict of expert opinion as to which was the safer. The conflicts were almost identical with those

in the case at bar, yet this court held that there was no issue for a jury to pass upon.

In *Chicago, M. & St. P. R. R. vs. Riley*, 145 Fed. 137, Judge Kohlsaat, after referring to the above cases, said:

"It may then be assumed for the purposes of this hearing that the switch stand in question was part of an engineering scheme, and therefore, in the absence of those manifest errors in construction which would be patent to an ordinary observer, did not involve a question of negligence to be passed upon by a jury."

In *Boyd vs. Harris*, 176 Pa. St. 484, 35 Atl. 222, the court, in speaking of an analogous question as to location of permanent structure, said:

The question "is whether the location of the permanent structures along a line of railroad, necessary to accommodate its business, is to be determined by the railroad company, or by a petit jury. If by the former, they may be located with reference to the convenient and economical use of the railroad, and the accommodation of its traffic. If by the latter, these considerations will be lost sight of; and the proper location will be a shifting one, to be settled by each successive jury in accordance with its own notions and the peculiar features of the case on trial. One jury may hold a given location to be safe and proper. The next jury may hold it to be unsafe, and therefore improper."

The court held that a charge of negligence could not be sustained by evidence of this character.

Our Design Standard Within Above Rule.

The testimony in the case at bar brings it directly within the rule of law above referred to. By the undisputed testimony, this type and size of bolt is standard, and is regularly installed on the new oil burning engines of the Great Northern Railway Company (Tr. pp. 97, 106), and the Spokane, Portland & Seattle Railway Company (Tr. p. 114), and they have been in use ten years in oil burning engines on the Santa Fe (Tr. p. 125), and six years on the Oregon Short Line (Tr. p. 135). They are also in use on the Southern Pacific (Tr. p. 183). On roads such as the Southern Pacific & Santa Fe, where the smaller head is the standard, this is solely because they are more economical to apply. (Tr. p. 192, 129.) The larger heads are considered the better type of construction, where safety alone is considered, even by roads using the taper heads as their standard. (Tr. p. 129.)

Even Mr. Pierron, the plaintiff's most experienced witness, testified that the button head bolt is universally used on coal burning engines, and that it is safer in some cases. "It is better in one way." (Tr. p. 58.) Where the water gets too low, any bolt will get red-hot, and the crown sheet as well, and in such a case the larger head will hold

up and prevent the explosion longer. It would pull through quicker on the taper head than on the button head. (Tr. p. 59.) This is the testimony of the plaintiff's own witness, and of course this reasoning would apply to an oil burner as well as a coal burner.

Necessity for Such a Rule Emphasized Here.

The present case illustrates far more forcibly than any of those cited the intolerable injustice of allowing a jury to find negligence in the adoption of a recognized mechanical standard. As we have seen, the witness Pierron had never seen bolt heads of this type in use on oil burning engines. (Tr. pp. 51, 53.) The plaintiff's other witnesses were even less qualified. Mr. McGrath was only five years out of school, and the designing of repairs for half a dozen boilers for five months was his only practical experience in the field of boiler construction. (Tr. p. 25.) He had never heard or read of a button head burning off, on an oil burning engine (Tr. p. 39), yet he testified that, in his opinion, that would be the result of using them. The plaintiff's only other expert was Mr. James McCabe, who was a locomotive engineer of thirteen years' experience, and he acted in the dual capacity of expert witness

and chief counsel for the plaintiff upon the trial, and drew the original complaint. (Tr. pp. 69, 78.) He had never seen bolt heads as large as the Great Northern type used on any other oil burning road. (Tr. p. 71.) In fact, he had never seen any button heads whatever used on other oil burning roads. (Tr. p. 76.) He was the only one of the plaintiff's witnesses who had ever seen a button head in use on an oil burner, and he had never seen one except on the Great Northern, and he nowhere states that he ever saw one burn off and let the crown sheet down. He had left the Great Northern in 1912, soon after they began to burn oil. (Tr. p. 79.) Their testimony that these bolt heads would become insulated and crystallized was not based on their own observations, nor on what they had heard of the observations or experiences of others, but purely and simply on a complicated and tenuous chain of theoretical deductions, from unwarranted premises as to temperatures in an oil burning fire box.

In his argument below counsel stoutly denied this, and accused us of misstating the record, and pointed triumphantly to the testimony of Mr. McCabe that he had *once* seen another Great Northern engine when the bolts were *leaking*, and looked as though they should be changed (Tr. p. 76), and also

to the testimony of Pierron that he had seen button head bolts leaking, and had calked them up, and had seen crown sheets come down, where they were used, "*but not on the oil burner.*" (Tr. pp. 57, 58.) His observations were all on coal burners, and there, he states, the button head bolt is universally used, and is the safest known. (Tr. pp. 58, 59.) Counsel failed to indicate a single shred of testimony that any of his witnesses had ever seen a button head bolt become insulated or crystallized, or come down, on an oil burning engine.

On the other hand, the greatest boiler experts in the country testified in favor of the button head type of construction, and denied that it had any part in causing the explosion in question, but attributed it entirely to low water. We shall not burden the court with a statement of their testimony here, because this argument is based on the weakness and insufficiency of the plaintiff's evidence, and not the strength of our own. We shall merely state that the list includes mechanical experts and officials employed on every oil burning railroad in the west, by the United States Government, municipal boiler inspectors, the chief inspector of one of the largest boiler insurance companies, and others. (Tr. pp. 96, 108, 113, 118, 120, 134, 174, 179, 182.)

These are referred to to emphasize the necessity, in cases of this sort, for some such rule as that which this court has adopted, if justice is to be done. Many of these men had examined the boiler in question immediately after the explosion, which none of the plaintiff's witnesses had done, and practically all of them had had actual extensive experience with button head bolts on oil burning locomotives. If this case were reversed—if the explosion had happened on an engine with taper head bolts—and the questions were submitted to the jury on this record, no jury in the world could fail to find that the taper head was the poorer bolt. In spite of all this, we stand convicted by a jury of negligence in adopting the type of bolt recommended by these engineers and justified by this experience. We can think of no stronger argument in favor of the rule that the adoption of a mechanical standard approved by experts cannot be found by a jury to be a "defect," due to "negligence," within the meaning of the Federal Act.

The Remaining Evidence Fails to Show a Defect or to Connect It With the Explosion.

If the above reasoning is sound, it would follow that there is no evidence whatever in this record upon which the verdict can be supported. If Mr.

Pierron's testimony be eliminated, there is no evidence of any "defect" existing at the time of the explosion, and no evidence whatever as to what the explosion was due to. No other witness even expressed an opinion as to what caused the explosion. The evidence of the other witnesses as to button heads, and all of the evidence as to fusible plugs and scale, fails entirely to afford any basis on which the jury could attribute the explosion to any one of these causes without venturing far into the realm of speculation and conjecture. We believe that a brief review of the testimony of the plaintiff's witnesses will demonstrate all of this.

The first witness, the only person produced by the plaintiff who examined the entire locomotive, either before or after the explosion, was Thomas Hanson, who was acting as fireman at the time. (Tr. p. 9.) He testified that the explosion was not due to low water, as the water glass showed sufficient water just before the explosion. (Tr. p. 10.) He admitted that an explosion would result if the engineer allowed the water to get too low. (Tr. p. 14.) He failed to negative any other possible cause for the explosion. He did not find any crystallization in the bolt heads. *The engine was in good normal condition* when the trip was started that

morning. (Tr. p. 10.) The witness looked into the fire box that morning, and only one bolt was leaking, and that is nothing unusual, and not a sign of danger. *Otherwise the fire box was in good condition.* (Tr. p. 20.) (Italics ours.) This witness did not attempt to show any defect whatever in the engine, nor to suggest any cause for the explosion. He is the only witness for the plaintiff who appears to have seen the engine at all, at least within several months, either before or after the accident.

Mr. James McCabe, one of the plaintiff's attorneys, testified that he had never seen a head as large as that numbered 1 on the diagram, on oil burning engines, except on the Great Northern. In his opinion, the expansion of the crown sheet, over the fire box, would cause one side or the other of the large bolt head to tip up, and a cushion or film of air would form in the opening. This would insulate the bolt head from the cooling effect of the water, causing it to overheat and crystallize, and finally to drop off and cause an explosion. This would not be so on the smaller head. (Tr. p. 69.) This result might be reached in a few minutes, or it might last for a good length of time, but hardly for five years. The inner sheet, exposed to the flame, should last

three to four years burning oil and fifteen to twenty years with coal. (Tr. p. 76.)

The witness examined the crown sheet and bolts on April 24, 1914. (Tr. pp. 46, 70, 71, 78.) The explosion was on November 5, 1915. (Tr. p. 10.) It does not appear that the witness had examined any other parts of the engine at all, either before or after the explosion, or that he had seen the crown sheet and bolts until nearly six months after the explosion. He does not testify that the bolts that he saw had actually become crystallized, nor does he state that in his opinion they caused the explosion. He expresses no opinion as to what caused the explosion. His testimony on this point, summed up, is that large bolt heads would have a tendency to cause an explosion within three or four years.

Mr. McCabe also testified that fusible plugs are used in oil burning engines, to prevent boiler explosions, and are practical. (Tr. p. 71.) A fusible plug is a steel plug with a soft metal core in it, which is screwed through the crown sheet. If the water is allowed to become too low, so that the crown sheet gets hot, the soft metal is supposed to melt and give warning of an explosion. However, he denies that the water had become low, or that the

crown sheet had heated, at the time of this explosion. (Tr. p. 71.) He does not express any opinion that it is a better or safer practice to use fusible plugs, or that they are desirable.

He does not even state that they could have prevented this explosion, except that "if the sheet had been overheated *a number of times*, the fusible plug would have melted out on the boiler, and the Great Northern officials would have noticed that that crown sheet and these crown bolts should have been inspected." (Tr. p. 77.) He makes no claim that the crown sheet had been overheated "a number of times," however. He admits that "if, on November 5, 1913, the engine * * * had had a fusible plug in the crown sheet, or half a dozen of them," it could not "possibly have prevented the explosion at that time if there was four inches of water on the crown sheet." (Tr. p. 77.)

He also testified that the threads in the bolt heads on part of the crown sheet showed signs of overheat. The only possible cause of this would be foreign matter or scale accumulated on top of the crown sheet which would insulate it from the water and will cause the bolt to become overheated. Proper boiler washing is a practical remedy for this. (Tr. p. 72.) He expresses no opinion as to whether this

accumulation of scale and heating of the bolts existed on the day of the explosion, or whether the overheating of the threads was caused at that time, or at some other time, nor as to whether the explosion was due to this cause. He does not dispute a great deal of testimony offered by the defendant that scale is not deposited from the water in this region. It would, of course, follow from this that if this engine ever had accumulated scale, it must have been when in use somewhere else, at some prior time.

He expressed the opinion that the explosion was not due to low water, but did not attempt to show that it might not have been caused by a latent defect or other cause. There was no attempt by the plaintiff's witnesses anywhere to negative any possible cause for the explosion, except that of low water.

Charles E. McGrath was the plaintiff's technical expert. He explained the construction of the boiler, and testified that an oil burning flame has an excessive heat, which will tend to overheat and burn the head of a bolt such as that used by the Great Northern. (Tr. p. 23.) He first stated that this might take a week or two (Tr. p. 28.), and later concluded that to become permanently weakened and

crystallized would take "anywhere from a month to twenty years." (Tr. p. 35.) He never had any practical experience nor read any reports from which he could determine how long it would take to form this opening. (Tr. p. 36.) He would not state any maximum or minimum time for this. (Tr. p. 39.) He had never heard or read any report of a large bolt head actually burning off, on any oil burning engine. (Tr. p. 39.) He had not examined the engine in question, did not testify that its bolts had become weakened, and expressed no opinion that they had caused the explosion, but concluded that it would not have been caused by low water.

He testified that safety fusible plugs "are used to prevent explosions," and "there is no reason why they cannot be used conveniently on crown sheets for this purpose. (Tr. p. 24.) He does not know how extensively they are used, and never saw one himself (Tr. p. 43.) He does not claim that a fusible plug would have prevented this explosion, with water on the crown sheet, and it would not have any bearing in this case, under any circumstances, "not that I can think of." (Tr. p. 43.)

He testified that scale will accumulate around the bolts on the upper side of a crown sheet and

cause overheating. (Tr. p. 24.) This is the extent of his evidence as to scale. He does not say there was ever any scale or signs of scale in this engine, or that it caused the explosion. He never examined this boiler or any part of it, expressed no opinion as to the cause of the explosion, and did not negative any other causes than those mentioned in the complaint, except that of low water.

The only other expert produced by the plaintiff was J. C. Pierron. In addition to his testimony on the subject of button heads, which we have already stated, he gave some testimony as to scale and fusible plugs. He stated that fusible plugs are used to give warning of low water, as they have a soft metal core which melts if the crown sheet becomes hot. (Tr. p. 48.) However, in his opinion, there was no low water at the time of this explosion, and he does not claim that a fusible plug would have done any good in this case. (Tr. p. 49.) A majority of the roads that he has worked on use them. (Tr. p. 48.) Later he said the only oil burning road that used them that he knew of was the Milwaukee, and they do not use them on most of their engines. (Tr. p. 51.)

He examined the crown sheet on April 24, 1914, nearly six months after the explosion. (Tr. p. 46.)

He claims that he found some discoloration in some of the bolt holes at that time, and could not think of any other cause for this except scale. (Tr. p. 49.) Railroad companies like the defendant do not allow scale to accumulate, if it can possibly be avoided. (Tr. p. 50.) He did not attempt to say when the discoloration was caused, or that any scale existed at the time of the explosion, or caused the explosion.

*Even the Evidence Offered to Show Possible Causes
Was Not Probative.*

We believe that the above is a fair summary of the plaintiff's evidence. In some respects it is more than fair, for it assumes that she offered perfectly satisfactory evidence on the one subject covered by her, which was the tendency to crystallization, and that that testimony was of a good character, as far as it went. As a matter of fact, this is a violent assumption, and while we shall not attempt to point out all of the many inconsistencies, shortcomings, discrepancies, and even absurdities, in their "expert" testimony, as we believe that these will be perfectly apparent to the court in even a cursory perusal of the record, we cannot refrain from referring to the very unconvincing character of what evidence they offer even on this question.

We have pointed out elsewhere that even the "tendency to crystallization" is pure theory, and not anything that any of the witnesses ever observed, or heard of as actually happening. And even the *theory* will be found to be deduced entirely from assumption as to an enormously high temperature in an oil burning flame. (Tr. pp. 22, 69.) These assumptions or premises, from which they draw their conclusions, are not only without any foundation, so far as the knowledge or observation of their witnesses is concerned, but are flatly contradicted by the only witnesses familiar with the subject, and by tests and standard authorities. (Tr. pp. 117, 144, 145, 192.) The witnesses for the plaintiff contradict each other, as we have already seen in the case of Mr. Pierron and Mr. McGrath, and one theory will contradict another theory of the same witness, as when Mr. McGrath first based his crystallization theory on the excessive expansion and contraction of the crown sheet, due to the assumption that the crown sheet would reach a temperature of 900 degrees in an oil burner, and then advocated installing fusible plugs that melt at a temperature of 400 degrees (Tr. pp. 29, 67); and also when he stated that the purpose of a fusible plug was to melt and let the water through, to quench the fire, although he later admitted that the plug would not melt until

the water was all gone (Tr. pp. 24, 43); and when Mr. McCabe testified that the blue discoloration of a crown sheet was everlasting, and then failed to point out any blue color in the bolt holes, although he claimed to have found blue color there six months before, when he had examined the crown sheet, and which he said was evidence of scale. (Tr. p. 194.) Moreover, their replies on cross-examination will be found to be evasive, and they were unwilling to have their theories put to any test, as we shall show later. So that they not only failed to offer *any* evidence on some vital points, but on the other points, where they did offer evidence, it was not convincing or probative.

The consideration which a question of this sort is entitled to in a law suit should not be different from what it would receive from a board of directors in adopting their standard type of boiler. Evidence of the character offered by the plaintiff would certainly not be considered probative by such a board. Bolt heads of this type had been in use on oil burners for ten years on the Santa Fe (Tr. p. 125), six years on the Oregon Short Line (Tr. p. 135), and five years on the Great Northern (Tr. p. 98). Why should such a board listen to the theories of experts as to what would *probably* happen, when

it would be so easy to look and see what had *actually* happened? The mere theory, even of a very great expert, would be of little comparative value in such a case. When a plaintiff is seeking to attack a well known and much used device, and avoids any evidence as to how it *does* work, his *opinion* as to how it *should* work is of little value. And this particular theory is an absolutely novel one, apparently never advanced before, and one that the men not familiar with these bolts had never heard of before coming into the court room (Tr. pp. 193, 184), while the experts advancing it had not taken the trouble to inform themselves of its workings in practice.

The Supreme Court of Virginia, in a case which will be referred to again a little later, refused to sustain a verdict based on evidence of this character, and said of it:

“We shall not extend this opinion by entering upon a detailed analysis of the evidence of expert witnesses for the plaintiff. The trial court allowed great latitude in their examination, and numerous theories were advanced as to what possibly might have caused the accident. However, it is enough to say that a painstaking examination of this evidence shows that the opinions of the witnesses were neither founded upon facts within their own knowledge nor established by other evidence in the case. Hence their conclusions were matters of speculation, and possessed no evidential value. Such

statements violate the fundamental principle (so often accentuated in opinions of this court) that an inference cannot be drawn from a presumption. A verdict resting upon such foundation is not the fruit of evidence, but of conjecture, and cannot be upheld."

*Even if Probative, Evidence Did Not Cover
Necessary Points.*

Even assuming, however, that the testimony offered on behalf of the plaintiff, so far as it went, was of a satisfactory character, we believe that the summary which we have given above is fairly complete, and that it contains no evidence whatever of any character, good or bad, to the effect that any defect existed *at the time of the explosion*, and no evidence that the explosion actually resulted from any defect then existing, and no attempt whatever to explain what caused the explosion. At the best, she *shows* two *possible* causes, but does not negative other possible causes except low water, or show even a probability or opinion that either of those suggested by her witnesses was the *actual* cause. She failed to summon any of the many witnesses who examined the locomotive after the explosion, or to find out from them whether it might not have been due to stoppage of the safety valve or water glass, excessive steam pressure, some latent defect, or

some other cause for which the defendant would not be responsible. After hearing all of her evidence, the jury had nothing but the opinion of Mr. Pierron to go on, except pure speculation and conjecture.

Some Evidence of Cause Required.

The rule is well established that some evidence of this causal relation is required, and that it is not sufficient to offer evidence that there may have been a *possible* cause, for which, if it existed, the defendant would be responsible. In *Labatt on Master and Servant*, 2nd Ed., Vol. 4, Sec. 1604, p. 4893, it is stated:

“ * * * * A servant cannot recover where it is merely a matter of conjecture, surmise, speculation or supposition whether the injury was or was not due to the negligence of the master * * * .”

Where a derailment has occurred, it is not sufficient to prove a defect in the engine or rails, which would afford a possible cause for the derailment, without showing that these things actually caused the derailment.

Peppett vs. Michigan C. R. Co., 119 Mich. 640, 78 N. W. 900.

“The jury cannot, from the mere fact that some defect existed in some part of complicated

machinery, conjecture that such defect was the direct and immediate cause of the accident."

Green vs. St. Louis Cooperage Co., 15 Mo. App. 202.

"There is no liability, where a pot containing acids was overturned, owing to slipping of one of the hooks on which it was supported, and the only evidence of what caused the accident was the testimony of an expert who had never seen the machinery, and had no knowledge of its condition, and who testified, in answer to a hypothetical question, that the accident might have happened from the hook slipping back toward the point after being properly placed in the lug, by reason of its faulty construction."

Wells vs. Celluloid Co., 65 N. Y. Suppl. 370.

Where a railroad engineer was killed by falling from a running board, evidence that there was some jarring of the engine and that it would be possible for this to cause such an accident, is not sufficient to establish a *prima facie* case.

Southern P. Co. vs. Johnson, 69 Fed. 559.

Where a bridge has collapsed, it is not sufficient to show that there was a certain defect, of a character that might cause a collapse.

Roanoke R. & E. Co. vs. Sterrett, 108 Va. 533, 62 S. E. Rep. 385.

In *Olmstead vs. Hastings Shingle Mfg. Co.*, 48 Wash. 657, 94 Pac. Rep. 474, the respondent showed

that there was a certain clamp projecting from the arbor of the shingle saw, in close proximity to the shingle chute where deceased was required to work, and that this would be a possible cause of the accident. The court held that it is not sufficient to show a negligent defect which might have caused the accident. There must be at least some evidence of the causal relation.

The jury in our case was in the position of a coroner's jury before whom a dead body has been brought. A friend testifies that the deceased had some bad habits such as heavy smoking. A doctor testifies that heavy smoking will cause heart disease, and heart disease may cause death. Without any examination of the heart, or any other organ, and without examining the body for bullet wounds, or other causes of death, the jury finds that the man died from heart disease.

This is exactly our case. This engine had a "bad habit" of using large bolt heads. Large bolt heads will produce crystallization, and crystallization may cause explosion. Without looking to see if these bolt heads were crystallized—or if the symptoms indicate that this explosion resulted from that cause—and without looking to see if there may not have been some other cause—the plaintiff demands

a verdict that crystallization existed, and that it caused the explosion.

*Not Only a Lack of Evidence, but Conclusive
Contrary Evidence Here.*

In our case, there was not only a dearth of evidence to support the plaintiff's case, but the strongest possible evidence against it, which we shall very briefly refer to. We did what the plaintiff should have done, and tested the bolt and bolt heads to see whether they were in fact crystallized.

Samples of button heads and crown bolts were tested by Prof. Daniels, Professor of Metallurgy and Minerology at the University of Washington, chemically and microscopically, and no signs of crystallization were found. "The material was wrought iron of high grade, and there were no flaws or weaknesses of any kind. (Tr. p. 112.) Elaborate experiments, subjecting button head bolts to the enormous heat of an oxy-acetylene flame, and testing their holding power, hot and cold were made, both with new bolts and bolts that had long use in oil burning engines, all of which demonstrated the superiority of the button head over the smaller head. (Tr. pp. 98, 99, 109, 126, 136.) And we summoned men who had actually used button head bolts on

oil burning engines, in actual operation, for from five to ten years, and asked them whether any openings formed, or whether the bolt heads became insulted, or overheated, or crystallized, and they all said "no."

The many authorities of high standing who testified for the defendant condemned the use of fusible plugs as undesirable, and testified that they have been abandoned by practically all of the railroads of the country and that they do not prevent explosions. Also it was shown without dispute that scale thick enough to cause overheating does not form in Cascade Mountain water, such as was used in this engine (Tr. pp. 149, 154), and that no scale had formed in the boiler. The inside or upper side of this sheet had been washed out and inspected nineteen days before the explosion, and there was no scale upon it then. (Tr. pp. 154, 155.) It had been washed and scraped in the shops, and a new flue sheet put in on May 24, a little over five months before the explosion. (Tr. p. 146.) The crown sheet had been inspected by the regular inspector at the terminal, the night before the explosion, and it was in good condition. (Tr. pp. 156, 157.)

It was the duty of the deceased engineer himself to make an inspection, and report any defects, and

apparently none had been reported. (Tr. pp. 13, 20.) And the fireman, who testified for the plaintiff, had looked into the fire box and found everything all right before starting on the trip. (Tr. p. 20.)

The plaintiff's failure to produce actual probative evidence in this case was not due to ignorance. This is not the case of an inexperienced attorney, with a meritorious case, but groping in the dark for his evidence. We have here three specific distinct charges made by an attorney with thirteen years' experience on several different roads, and who himself operated engines of this very type, if not this identical engine, and who has also worked on other roads. Surely if evidence were available he could have secured it.

Nor was the plaintiff's failure to make an examination of these bolts and bolt heads and to produce evidence of their actual condition due to any want of opportunity. Samples of the bolts from the engine which exploded were produced in evidence, and the plaintiff was offered the privilege to test, or to designate for further testing by us, any one or more of the two hundred bolts which were removed from that engine, but this offer was not accepted. (Tr. pp. 44, 65, 124.)

The plaintiff was also invited to test Mr. Pierron's theory that button heads could be made red-hot in any oil burning engine. We requested Mr. McCabe to designate any oil burner on the road and offered to have it called in and let Mr. McCabe himself force the flame as much as he could, and have the jury inspect the effect on the bolt heads. The plaintiff objected to having this test made. (Tr. pp. 145, 146.) The plaintiff also objected to having her own witness Pierron test any of the bolts or button heads which were in the court room, with a chisel and hammer, although he stated that he could determine in this way whether they were crystallized. (Tr. pp. 55, 56.)

We presented to the State court an argument somewhat similar to that so far advanced in this brief, based upon the lack of any evidence, on the plaintiff's behalf, that a defect existed at the time of the explosion, or that such a defect caused the explosion, and that court seems to have entirely overlooked our point, for they say:

"The contention is not made that there was a total lack of evidence of negligence, and there being some evidence that the button head bolts *have a tendency* (italics ours) to become overheated by an oil flame and allow the crown sheet to give, which would result in an explosion, it was for the jury to say whether their use under such circumstances was negligence."

We do not dispute that there was some evidence of this *tendency* to crystallize, but we certainly did make the contention that there was a "total lack of evidence of negligence," or of evidence that the bolt heads *had* crystallized, or that this had caused explosion.

Res Ipsa Loquitur Not Applicable.

Counsel for defendant in error in his brief below failed to point to any evidence which would meet this vital deficiency in his case, but argued that no evidence was necessary, as the doctrine of *res ipsa loquitur* should apply, and in support of this he cited the case of *Marceen vs. Rutland R. R. Co.*, 211 N. Y. 203, 105 N. E. 206. In that case, however, this deficiency did not exist. There was evidence there to show the cause of the explosion. In our case the vital question is whether the bolt heads gave way first, or whether the crown sheet became hot and gave way. If it were once established or conceded in this case that the heads parted from the bolts, and let the water through, the rule in the *Marceen* case might govern. There was a showing as to what it was that gave way. In the words of the court:

"One of the flues which extend longitudinally through the boiler from the rear flue sheet

to another flue sheet next the smokestack had been pushed or blown out of its socket in the rear flue sheet so that the forward end of the flue projected several feet beyond the forward flue sheet, thus leaving an opening in the rear flue sheet through which the boiling water and steam were admitted into the fire pot where the explosion was generated."

This was not a bursting or explosion in the true sense of the word, but merely the separation of one flue from its flue sheet. No part of the shell of the boiler was ruptured or forced out by internal pressure. The court merely held that this being shown, and the entire duty of inspection and repair resting on the railway company, and there being no contention that the plaintiff, a fireman, could possibly be himself responsible, the jury might find *negligence* from these circumstances. This is very far from holding that they might determine what it was that gave way first and caused the explosion, by conjecture or without evidence, or that negligence can be inferred merely from the fact of an explosion, without any evidence as to what caused it.

In our case the engineer himself was in charge of this engine, and had been previously. Mr. Hanson had fired for him several times, and had been working on this same engine prior to the accident. (Tr. pp. 12, 16.) He had made the trip across the

mountains on the preceding day, with the same engine. (Tr. p. 94.) It was the engineer's duty to make an inspection and report defects. (Tr. pp. 13, 20.) None of these facts existed in the *Marceau* case.

Our case is much more closely parallel to that reported in *Virginia Ry. Co. vs. Andrews*, 118 Va. 482, 87 S. E. Rep. 577, where, as here, there was not sufficient evidence to show just what had given way first, and caused the explosion. The plaintiff there, as here, produced "experts," of doubtful expertness, who, in the words of the court, "advanced numerous theories as to what possibly might have caused the accident." The court held this evidence was insufficient. However, the plaintiff argued that no such evidence was necessary, as the Boiler Inspection Act, like the Safety Appliance Act, imposes an absolute obligation upon the carrier, and casts upon it the burden of accounting for the explosion, but the court said:

"In these circumstances, upon settled principles, the mere happening of the accident did not *per se* cast upon the defendant the imputation of negligence; but to warrant a recovery, the burden rests upon the plaintiff to prove that the plaintiff had been guilty of the negligence alleged in the declaration."

More of the opinion of the court in this case will be quoted later, in discussing the instructions which were given to the jury in our case.

The application of the doctrine of *res ipsa loquitur* has been negatived by the Supreme Court of the State of Washington, in an explosion case, in *Lynch vs. Ninemire Packing Co.*, 63 Wash. 423, 115 Pac. Rep. 838, upon the ground that the injured party "was himself a part of the operating force, and was in a position to have done some act which might have caused or contributed to the explosion." (Page 428.) In the case at bar, the deceased was in control of the engine, and it appears from the plaintiff's evidence that he could himself have caused the boiler to explode, by allowing the water to become too low, and that it was a part of his duty to look out for this. (Tr. pp. 15, 16.)

We conclude then, that since the only opinion expressed in the plaintiff's entire evidence as to the cause of the explosion simply disclosed a difference of engineering opinion as to the best *design* for the boiler, and did not attribute the explosion to any *defect*, or want of repairs; and since this opinion, and all the other expert opinion as to *possible* causes, was not based on observation or knowledge, but only on theory and deduction from

unestablished premises; and since, aside from this, the plaintiff summoned no witnesses who examined the engine, and produced no evidence that either crystallization or scale existed at the time of the explosion, and refused to make any examination to determine this question; since she failed either to offer either opinion or evidence attributing the explosion to one of these causes, or to exclude other possible causes; and since we showed conclusively that neither of these defects existed at the time of the explosion, and that our type of construction was the safest known, a verdict should have been directed in our favor, according to the terms of the Federal Act, which specify that a "defect," due to "negligence," must be shown as the "cause" of the injury.

Evidence Conclusive in Our Favor.

We believe that we are also entitled to judgment in our favor upon an entirely different ground. Not only did the plaintiff fail to offer any evidence that the explosion was due to any "defect," or "negligence," for which we are responsible, but our evidence conclusively showed that it was due to a cause for which the *decedent himself* was responsible. The undisputed physical facts showed

that it was due to the fault of the engineer, in allowing the water in the boiler to become too low.

The plaintiff offered the testimony of the fireman, as an eye witness, to dispute this, and ordinarily this seeming conflict would have to be resolved by the jury.

Physical Facts and Natural Laws Control, Where Undisputed.

In this case, however, the opposing evidence consisted of conceded physical facts, and undisputed natural laws, which demonstrated the impossibility of there having been water upon the crown sheet when the boiler exploded. It has been held by this court, and nearly every other court in the land, that under these circumstances a jury will not be allowed to believe what manifestly cannot be true, nor to base a verdict on a manifest impossibility. Such testimony does not raise a conflict.

Mr. Elliott, in his work on evidence, Section 39, as quoted by the Supreme Court of Kansas in *Wichita Ice & C. S. Co. vs. Sheppard*, 82 Kan. 509, 108 Pac. 819, says:

“Even though it (the court) may not be authorized to weigh evidence and pass upon the facts, it may, and should, so use its judicial

knowledge as to bring about justice. Thus, there are often undisputed physical facts clearly shown in evidence, and, by applying to them a well-known law of nature, of mathematics, or the like, it is demonstrated beyond controversy that the verdict or finding is based upon what is untrue and cannot be true. In such cases it is very generally held that the appellate court should take judicial notice of the law of nature or mathematics or quality of matter, or whatever it may be that rules the case, and apply it as the trial court should have done."

Labatt on Master and Servant, 2nd Ed., Vol. 4, p. 4892, says:

"And the verdict for the plaintiff will be set aside, if, in view of the facts established by the evidence, it was a physical impossibility that the accident should have happened in the manner alleged."

No conflict is raised by the testimony of an eye-witness that a certain machine acted in an abnormal way, when admitted natural laws, applied to the conceded method of construction of the machine, shows that such abnormal operation would have been impossible. Such testimony cannot be believed and does not raise an issue.

Chybowski vs. Bucyrus Co., 127 Wis. 332, 106 N. W. 833.

The court in the case last cited says:

"Nature's unchanging and unchangeable laws, and the unvarying and invariable princi-

ples of mechanics, cannot be turned aside by the verdict of a jury, even if the matter concerning the same is given into their hands accompanied by a judicial suggestion that there may be reasonable doubt in respect thereto. * *

“When the evidence in relation to a controverted question of fact on the one side accords with what must necessarily have been the case under given undisputed and indisputable circumstances, and the evidence on the other side is opposed thereto, obviously there is no room for conflicting reasonable inferences, consequently no question for solution by a jury. Whether such situation does or does not exist in any case is a matter for the court to determine. * * *

“Where the evidence is sufficient only to give rise to mere conjecture in favor of the plaintiff, or to suggest merely a possibility of the truth being as claimed by him; * * * or the evidence in his favor is contrary to all reasonable probabilities—the jury are placed in a false position by being directed to determine upon which side are the major and controlling probabilities. The court in such circumstances, without a motion in that regard, should apply the law thereto and dispose of the litigation accordingly. Refusal in that regard, in face of a proper motion invoking judicial action, is no less than the denial of a right.”

The testimony of a witness that he struck his head at the entrance to a tunnel, while riding on top of a box car, raises no conflict, where the undis-

puted facts show that he would have to be nine feet tall to accomplish this feat.

M., K. & T. R. Co. vs. Collier, 157 Federal 347.

It is familiar law, that a witness does not raise any issue of fact by stating that he looked for a train and did not see it, when the conceded physical facts show that it must have been in plain view.

Myers vs. B. & O. R. Co., 150 Pac. St. 386, 24 Atl. 747.

McCarthy vs. Bangor & A. R. Co., 112 Me. 1, 90 Atl. 490.

(See a complete note on this subject in connection with report of this case in 54 L. R. A., N. S. (1915 B), p. 140, citing several dozen cases on this subject, and showing that this rule is applied even where the party's testimony that he looked and listened is corroborated.)

This same rule was recognized by this court in a railroad crossing case, in *Northern Pacific Railway Co. vs. Freeman*, 174 N. S. 379, 19 Sup. Ct. 763; 43 Law Ed. 1014.

In any boiler explosion case it should be an easy matter to determine whether any part of the boiler was red-hot when it exploded. It is the commonest kind of knowledge that cold steel does

not behave like red-hot steel, when subjected to strain or pressure. By taking the indisputable facts written into the steel itself by the force of the explosion, and applying well-known natural laws, it should be possible to reach so certain a conclusion that a contrary narrative should only be regarded as further proof of the weakness of mortal observation and memory, or of mortal honesty.

Physical Facts and Natural Laws Undisputed Here.

Such evidence was produced in this case. The crown sheet itself, with many of the bolts and such of the bolt heads as could be found, were brought into court, and the physical facts relied on, were pointed out to the jury, and there, indelibly engraved in the distortions and stretchings of the metal itself, were found some eight or nine conclusive proofs that the metal had been red-hot when the sheet exploded.

In the first place, the sheet had been stretched out in both directions, so that it was actually four inches longer one way, and four and five-eighths inches longer the other way. The sheet itself was produced to prove it, and there was no dispute about it. (Tr. pp. 100, 115.) Then again, this stretched portion of the sheet was thinned down to two-thirds of its former thickness. (Tr. pp. 102, 127.) Also,

not only was there a large sag in the sheet as a whole, but there were little sags or ripples between each four bolts, giving the sheet a quilted appearance. (Tr. pp. 100, 115, 127, 184.) Moreover, the holes through which the bolts had passed were enlarged, and instead of being round had become elongated or oval shaped. (Tr. pp. 102, 127, 184.)

It was shown by reference to standard authorities, by tests, and by expert opinion, all absolutely without dispute or question, that steel cannot act in this way unless it is red-hot. Steel that is not red-hot will begin to rupture when subjected to more strain than it can resist. It will not yield, as hot metal will, and cannot be stretched and thinned down, without destroying the fiber of the metal. When a crown sheet is not heated beyond a normal steam temperature, it will sustain twice the normal pressure without sagging or rippling between the crown bolts. Moreover, the bolt holes could not be enlarged or elongated without rupture unless the metal were red-hot. (Tr. pp. 100, 102, 115, 122, 127, 133, 180, 185.) Moreover, this very sagging and rippling and enlargement and stretching of the bolt holes conclusively showed that *the bolt heads had not dropped off, but were holding and exerting a tremendous stress upwards*, even after the sheet

itself had become red-hot, and had begun to sag in between the bolts. If the bolt heads had been the first to give way, obviously there would have been nothing to stretch the holes and bend their edges upward, or to cause the sagging between them.

The strength and ductility of cold steel and of red-hot steel clearly depend on scientific laws, as well settled and as well recognized among metal workers as the law of gravity. These laws were not disputed, they were not even questioned by any witness, nor by counsel in argument.

Moreover, there were other almost equally conclusive indications. Experience and tests demonstrate that pulling a crown sheet down over a bolt head will strip the threads in the bolt holes of the sheet, unless it is red-hot. If it is red-hot, the edges of the holes would simply be bent up and enlarged at the top, leaving the threads intact. These threads were not stripped, but were left intact in the manner described. (Tr. pp. 98, 100, 102, 115, 180, 184, 185.)

Again, on the inside of any boiler is a thin film of scale or color which cannot be washed off or removed, except by heating the metal to red-hot or almost red-hot temperature. On this sheet this scale

had been burned off from the entire area, which showed the other signs of overheating. (Tr. pp. 103, 127, 128, 180.) This is also the area which is exposed to the hottest flame in the fire box, around the center of the sheet, and which would naturally heat first. (Tr. p. 105.) Neither of these physical facts, nor natural laws, were disputed or even questioned in any way by the plaintiff.

It is also a scientific fact that steel will not assume the blue discoloration shown by recently heated metal unless it has been red-hot. The plaintiff's witnesses themselves testified to this. (Tr. p. 194.) Every witness who inspected this crown sheet after the explosion testified that it had this blue discoloration in the center, where the other signs of overheating appeared. (Tr. pp. 119, 120, 121, 122, 150, 159, 174, 175.) No one who saw the sheet at the time disputes this.

Mr. McCabe and Mr. Pierron examined the sheet about six months after the trial, and state that it was not blue then, except in the bolt holes, and no one contends that it was blue, even in the bolt holes, at the time of the trial. Mr. McCabe stated that this blue color was permanent, and could not have disappeared, if it had ever been present, and drew the conclusion that the sheet never had

been blue; but yet they themselves base their entire *scale* testimony on a *blue color which they found in the bolt holes* when they made their examination in April, 1914. This had evidently disappeared at the time of the trial, for they made no attempt to point it out to the jury. Moreover, as our witnesses pointed out, there is hardly a piece of steel in existence which has not been heated red-hot, yet no one ever saw new blue rails being laid, blue horseshoes being applied, or blue car wheels running, even on new cars, nor machinery in a burned mill remaining blue for very long after the fire.

All this evidence, except the blue color, was shown to the jury by production of the sheet in court, and seven witnesses, several of them disinterested, testified to the color. This evidence of nearly five inches of stretching, of the thinning down of the metal, of the sagging between bolt holes, and of the elongating and turning up of the bolt holes, does not depend upon human observation or recollection, nor upon human testimony. It is engraved in every fiber of the metal, by the unerring hand of nature, and it cannot deceive. If a sheet of steel cannot assume this condition unless it was red-hot (and no one disputes this), *then this sheet was red-hot*, and an eye-witness to the contrary can

no more be believed that if he were to say that he saw water flowing uphill, or a heavy weight floating in the air without support. His testimony is *impossible*, and under the decision above cited, it created no conflict and made no issue for the jury.

*The Only Opposing Testimony Further Weakened
by Impeachment.*

This rule of law is the more applicable in the present case for the reason that this contrary testimony of the plaintiff's only eye-witness was impeached by a written statement, signed by himself in the presence of two witnesses a day or two after the accident, and repeated to a third witness three or four weeks later. (Tr. pp. 91, 93, 94, 95, 96.) To meet this silent but undisputed and indisputable testimony of the steel itself, plaintiff had nothing but the testimony of one eye-witness, who was impeached by three living witnesses and by a written statement over his own signature. Of course, he claimed that he was not in possession of his faculties when he signed the first statement, and denied making the second, but the impeaching witnesses all testify to his sound mental condition and intelligence at the time. So that it is indeed a broken

reed upon which the plaintiff relies to dispute the testimony written into the steel crown sheet.

Low Water Conceded to Be Due to Engineer's Fault.

It is conceded, we believe, that if the crown sheet was in fact red-hot, when the explosion occurred, the plaintiff can not recover. Her own witness, Hanson, admitted that low water will cause an explosion. The water gets off the crown sheet and no longer keeps it cool, so that it becomes softened and will not longer stand the steam pressure. (Tr. p. 16.) He also stated that this engine had a plentiful supply of water in the tender, and the engineer had a proper equipment for getting it into the boiler at the time of the explosion, and had appliances for determining when the water is getting too low, and it is a part of the engineer's duty to look out for these things, and see that the water is supplied to the boiler. If for some reason the water should get too low he can take steps instantly which will prevent an explosion. (Tr. pp. 15, 16.) It would follow from this evidence, offered by the plaintiff's witness, that if, as the physical facts prove, the crown sheet was red-hot at the time of the explosion, this is solely attributable to the failure of the engineer to per-

form his duty, and there can be no recovery in this action.

*No Foundation for Defendant's Only Reply to
Above Argument.*

A similar argument to that which we have been making above was presented to the court below, and brought forth no suggestion from opposing counsel, either that the sheet was not distorted in the manner alleged, or that it could become distorted in that way without getting red-hot. His only reply was to make two assertions of fact, neither of which had any support in the record, and both of which were contrary to the undisputed facts. His first statement was that scale would account for all of this distortion of the metal, and all of the other symptoms except blue discoloration, and that the evidence of this distortion, instead of proving our case, simply operated to establish his allegation of scale on the crown sheet. His second claim was that scale would *not* produce the *blue discoloration*, as that required a higher temperature than scale would cause. This blue discoloration, he says, was not present, but only the results that scale would produce, and therefore scale was the cause.

All this was based upon his unsupported statements, made for the first time in his reply brief in the State Supreme Court, that scale *would* produce one condition, and would not produce the other. There was no *evidence* of either statement. He never asked any of our witnesses, who explained these things, if the same results could be caused by scale. He never called his own witnesses in rebuttal to ask them. He depends entirely on his own assertions, and never made them until he reached the appellate court. The evidence is to the contrary. The only effect of scale, according to any portion of the testimony, is (1) to cause a blue discoloration in the bolt holes, or (2) to cause a "mud burn" or sag in the steel in some one spot where the scale collects locally. (Tr. p. 190.) Their own witness, Hanson, stated that there was no such indication on this sheet before the explosion, but that it was in good condition. (Tr. pp. 10, 20.) And no one pointed out any "mud burn" or suggested any other indication of scale except blue bolt holes at the time of the trial. Moreover, as we have already seen, scale thick enough to cause overheating does not form in the water in use on this division, and none was found after the explosion. All this was undisputed.

And there is no greater foundation in the record for counsel's claim that the blue discoloration requires a higher temperature, or that the steel would stretch at a lower temperature. On the contrary, the undisputed testimony is that *all* of the nine conditions referred to would require an equally high temperature, which is described by some of the witnesses as "red-hot." (Tr. pp. 133, 137, 174, 176, 179, 184.) The temperature necessary to produce the distortion and stretching was estimated by some of the witnesses at about 1300 degrees. (Tr. pp. 179, 133.) Steel shows red at 509 degrees. (Tr. p. 29.) There is no word of testimony that it would take a higher temperature than this to produce the blue color.

If there is such a thing as "damnation by faint praise," there must also be such a thing as admission by faint denial, and nothing has so confirmed our confidence in the arguments above advanced as the fact that diligent and ingenious counsel have had to go outside the record for statement of fact to form even the semblance of a reply.

The comment of the State Supreme Court upon our argument, that the proof of low water as the cause of the explosion was conclusive, is as follows:

“Appellant introduced the testimony of over a dozen boilermakers, master mechanics, boiler inspectors and others, all of whom stated positively that the conditions after the explosion conclusively showed low water as the cause. We do not agree, however, that this testimony established undisputed scientific facts. The evidence at best was of a negative character, and the statements of the witnesses were their opinions, drawn from their previous experience. Because they had never known the conditions shown here to occur, except from a low water explosion, they concluded that they could not result otherwise.”

We submit, with all deference to the court below, that this statement evinces a failure to clearly analyze the evidence. They treat the case as though a dozen witnesses, who had observed previous explosions with and without low water, had simply testified that they had never seen low water explosions without the stretching and distortion, and had never seen the distortion except in low water explosions. In other words, they view the evidence as an attempt to define the natural laws governing *boiler explosions*. But this is far too narrow a view. It is some of the *fundamental*, elementary laws of *physics* and not merely the usual results of boiler explosions that we rely on. Whether a sheet of steel eight by ten feet, and five-eighths of an inch thick can be stretched five inches longer and

one-third thinner, without breaking it, if it is not red-hot, is a question of *physics*, which can be answered in the laboratory at any time, or by reference to any standard work on metallurgy. It may depend upon past experience—but so does the statement that oxygen and hydrogen, united, will burn and form water, and not alcohol. Such a statement can only be based upon the past experience of the witnesses or of other scientists, but it is none the less a *scientific fact*.

The distinction between what men refer to as a “scientific fact” and what the court below referred to as a mere statement of “opinions drawn from their previous experiences” is that the former can be verified at any time by laboratory test, or reference to standard works, while the latter can not. If our evidence were confined to statements as to how *boilers* have acted in the past, when exploded, the court’s comments might be sound. But the question is not how *boilers* act under certain conditions, but what is the strength and *ductility of steel* at various temperatures? This, we submit, was established as an undisputed scientific fact, and as an admitted law of physics.

The testimony of Mr. Russell, Chief Locomotive Designer for the Southern Pacific Railway Com-

pany, was surely more than a narration of personal experience regarding boiler explosions, when he said:

"You will notice the holes, that the sides in practically every case are stretched and in most cases elongated, and the sheet is also quilted between the stays. Now that is impossible with material of the quality that this sheet must have been, to sink or elongate as it did in this particular case, or, in fact, any such material as is used in boiler construction, to permit of that distorting or quilting or sag between the stays. In other words, the sheet must have become red-hot to permit of this bag in that shape. That is generally conceded by authorities as one of the best indications of the sheet being hot. I believe that that is referred to particularly in a treatise on steam power by Wilcox, Babcock and others. If you have such a book present I think you will find that is referred to. Another thing, it would be impossible to take a piece of cold metal and stretch it until it became as thin as this material is here at the center of the bulge without it giving visible indications of the rupture. The chances are uniform that it would crack, or part, or sever, or, if it didn't sever, the scale or skin would be rough or would be broken owing to the molecules or particles in the iron; the iron would be spread in strips parallel with the line on which it was pulled, and this is not.

Another point that the sheet was hot is the change in the shape of these holes. If that sheet had been pulled off while it were cold—I mean at the temperature that it would naturally be with 200 pounds pressure in the boiler and the hottest oil fire that could be obtained in an

oil locomotive—it would be impossible to pull those holes in that sheet off the bolts without stripping the thread. The only means by which that sheet can come off the bolts without stripping the threads would be if the sheet were hot. Then the threads on the upper side would not be stripped. You will notice the threads on one side are gone, while on the other side they are practically intact. I don't know that there is anything further except the general appearance of the sheet as a whole.”

See also the opinions of other witnesses, on pages 180, 127, 100, 102, 115, 122, 133 and 185 of the Transcript.

In this case, to again quote the words of Mr. Elliott, in his work on Evidence, we have “undisputed physical facts, clearly shown in evidence, and, by applying to them a well-known law of nature, of mathematics, or the like, it is demonstrated beyond controversy that the verdict or finding is based upon what is untrue, and cannot be true.” In such cases, he says, “it is very generally held that the appellate court should take *judicial notice* of the law of nature, of mathematics or *quality of matter*, or whatever it may be that rules the case.” (Italics ours.) This we ask this court to do, and we believe that the ductility of steel at a given temperature, and the degree of temperature required to produce a given ductility, can readily be verified in any

standard text book of which the court may take judicial notice. We believe that under this rule the testimony of the fireman raised no conflict, and it must be regarded as conclusively established that the explosion was due to the fault of the deceased engineer himself.

For either one, or both, of these reasons, we believe that a verdict in our favor should have been directed, first, because the plaintiff failed to produce any evidence of any "defect," due to our negligence, or any evidence that the explosion resulted from such a defect; and second, because the conceded physical facts, viewed in the light of undisputed natural laws, show conclusively that the explosion was due to failure of the engineer to keep sufficient water in the boiler.

SPECIFICATIONS NOS. 5 AND 6.

Is the Defense of Assumption of Risk Barred by the Employers' Liability Act and Boiler Inspection Act?

These specifications raise a somewhat novel and interesting question, which, so far as we have discovered, has never been passed upon by any court of last resort, although the principle upon which our

argument depends, has been recognized and adopted by the Supreme Court of Virginia, as we shall shortly point out.

Section 4 of the Employers' Liability Act provides:

"That in any action brought against any common carrier under or by virtue of any of the provisions of this act to recover damages for injuries to, or the death of, any of its employes, such employe shall not be held to have assumed the risk of his employment in any case where the violation by such common carrier of any statute enacted for the safety of employes contributed to the injury or death of such employe."

Section 2 of the Boiler Inspection Act provides:

"That from and after the first day of July, nineteen hundred and eleven, it shall be unlawful for any common carrier, its officers or agents, subject to this Act to use any locomotive engine propelled by steam power in moving interstate or foreign traffic unless the boiler of said locomotive and appurtenances thereof are in proper condition and safe to operate in the service to which the same is put, that the same may be employed in the active service of such carrier in moving traffic without unnecessary peril to life or limb, and all boilers shall be inspected from time to time in accordance with the provisions of this Act, and be able to withstand such test or tests as may be prescribed in the rules and regulations hereinafter provided for."

We requested the trial court to instruct the jury as follows:

"You are instructed that even where an employer, such as a railroad company, is negligent in the construction or maintenance of its tools or equipment, such as a locomotive, yet, an employe who accepts, or continues his employment, knowing of the existence of such defects or negligence, and knowing the danger therefrom, assumes the risk of the injury to himself from such defects and cannot recover if he is injured as a result of them. This would not be true in the present case, if the negligence or defects involved some violation of a United States statute, but there is no evidence of any violation of such a statute in this action, so that the rule which I have just given to you would apply in this case. Therefore, even if you find that the defendant company had been negligent in adopting an improper type of bolt, or in failing to install fusible plugs, or in some other particular in the construction or maintenance of this boiler, and even though you should also find that such negligence caused the explosion, still, the plaintiff cannot recover in this action, if you should also find that the deceased, V. H. Thoms, was familiar with the type of construction used, or the particular form of negligence involved, and knew the danger likely to arise therefrom, or if, in the exercise of a reasonable care, he should have known of these things prior to the time of his injury." (Tr. p. 251.)

The court refused to give this instruction, but instructed the jury as follows:

"You are instructed that the law provides that it shall be unlawful for any common car-

rier, as was the defendant, engaged in interstate commerce, to use any locomotive engine propelled by steam power, unless the boiler of the locomotive and appurtenances thereof are in proper condition and safe to operate in the service to which the same it put, that the same may be employed in the active service of said carrier in moving traffic, without unnecessary peril to life and limb; and that no employee shall be deemed to have assumed any risk of death by reason of any locomotive engine operated in violation of said law, and that no employee injured or killed by reason of a locomotive engine operated in violation of said law shall be held to have been guilty of contributory negligence.

“Therefore, if you shall believe, from a fair preponderance of all the evidence in the case, that the boiler of the locomotive engine No. 1902 or the appurtenances thereof were not in proper condition and safe to operate in the active service of the defendant in moving traffic without unnecessary peril to life or limb, by reason of the negligence of the defendant, in any one or more of the three respects alleged in the complaint, then and in that case Vance H. Thoms assumed no risk of death and was guilty of no contributory negligence, and the affirmative defenses must fail.

“However, if such boiler and appurtenances were in proper condition and safe for such use in moving traffic, but due to defendant's negligence were defective in one or more of the respects alleged in the complaint and Vance H. Thoms has actual knowledge of such defect or defects, or such defects were so plainly observable that in the reasonable exercise of his faculties he should have known of

such and may be presumed to have known thereof and the dangers that surrounded him, then Vance H. Thoms assumed the risks of injury and the plaintiff cannot recover in this action." (Tr. p. 199.)

The question is whether, under these two statutes, taken together, the defense of assumption of risk is barred in any and every case where the jury may find that an unsafe boiler was used, for that is the effect of the court's instruction.

It is now definitely established that in any action under the Federal Liability Act the employee must be held to have assumed the risk of any defects known to him, and which are not in violation of a Federal statute, even in cases of the "secondary and ulterior risks arising from abnormal dangers due to the employer's negligence."

Jacobs vs. Southern R. Co., 241 U. S. 229,
36 Sup. Ct. Rep. 588, 60 Law Ed. 970.

In the absence of a statute, the specific facts of this case have been ruled upon, and the employee has been held to have assumed the risk of a defect in a locomotive boiler or its appurtenances, likely to cause an explosion, where he knew of the danger.

Seaboard Air Line Ry. Co. vs. Horton, 233
U. S. 492, 34 Sup. Ct. Rep. 635, 58 Law
Ed. 1062.

The question now is, therefore, whether the Boiler Inspection Act changes this rule.

In the *Horton* case, *supra*, in considering the effect of Section 4 of the Federal Liability Act, abolishing the defense of assumption of risk in certain cases, this court said: "By the phrase 'any statute enacted for the safety of employees' Congress evidently intended Federal statutes, such as the Safety Appliance Acts, and the Hours of Service Acts." The court below held that Section 2 of the Boiler Inspection should be classed with the above statutes, and that if the jury should find that our boiler was unsafe to operate, it would follow that we had violated the statute, and the defense of assumption of risk would be barred.

The effect of the court's instruction is to leave it to the jury to determine whether our type of boiler construction was proper; that is, whether a boiler constructed with large button heads is "safe to operate" in interstate service. And yet the subsequent sections of the Boiler Act provide for the adoption of specific boiler regulations by a Federal Boiler Inspector and declared that the carrier must comply with these regulations. We are therefore met with an irreconcilable conflict at the outset, for the act declares that we must comply with the regulations of the Federal inspectors in the construction

and care of our boilers, and then if the court's instruction be correct, declares that we thereby violate the law if a petit jury shall later determine that such construction was unsafe. We want to make it clear that this is exactly the effect of the court's instruction to the jury—for if this is clear it will at once be seen that it involves an impossible construction of the Act.

The court instructed the jury in effect that if they should believe that the boiler was not safe to operate "by reason of the negligence of the defendant in any of the three respects alleged in the complaint," then the defense of assumption of risk was barred. One of the "three respects alleged in the complaint" was "that the button heads of the crown bolts of said boiler were excessively and unnecessarily large and consequently unduly exposed to the direct heat produced by the oil fuel used on said locomotive." We call attention again to the fact that this does not allege any deterioration in quality or want of repair, but simply that the design of the bolts was improper. We also call attention again to the fact that Mr. Pierron testified that in his opinion the explosion happened, not because the bolts were crystallized or deteriorated, but because bolts of that size would necessarily overheat.

We believe we have shown in the first part of this brief that this was the only evidence offered by the plaintiff under which the jury could attribute the explosion to any specific cause, without speculation or conjecture; but whether this is correct or not, the record certainly contains some evidence, that the explosion was due directly to the design of our button heads. It follows then that when the court told the jury that the defense would be barred if they found that our locomotive was unsafe in any respect alleged in the complaint, they were told in effect that if, in their judgment, the design of the bolt heads was unsafe, then this would constitute a violation of the Boiler Inspection Act and the deceased would not assume the risk.

Let us now consider what effect such a rule would have under the remaining sections of the Act. Section 5 provides that rules and instructions shall be filed by each carrier, and that the chief inspector shall make all needful rules, regulations and instructions for the conduct of his office and for the government of the district inspectors, which shall be approved by the Interstate Commerce Commission, before they take effect. Section 6 provides that each inspector shall see that defects in locomotive boilers are repaired. If the inspector finds that

any locomotive boiler or apparatus does not conform to the requirements of the law (including Section 2) or rules and regulations established and approved as hereinbefore stated, he shall notify the carrier in writing that the locomotive is not in serviceable condition, and thereafter such boiler shall not be used until placed in serviceable condition. Section 9 provides that any common carrier violating this Act or any rule or regulation made under its provisions, or any lawful order of any inspector, shall be liable to a penalty of \$100.00.

It is clear from these provisions that Congress left it to the district inspectors, with right of appeal to the chief inspector, to determine what shall constitute a locomotive which is "safe to operate" in interstate service. If the boiler is unsafe or defective, whether by reason of bolt heads which are likely to overheat and drop off, or if for any other reason it "does not conform to the requirements of the law," which says that it must be "safe to operate," the inspector must take the boiler out of service. If the Federal inspectors had determined that the button head type of bolt head was unsafe to operate, they could take every locomotive of that design out of service, and thereby compel us to use the taper head. Likewise, if they should conclude that the taper head was unsafe, by reason of not

having sufficient strength, they could take locomotives built in that way out of service, and compel the use of the button head. And under the court's instruction, the carrier, after complying with this requirement, would nevertheless be guilty of a violation of the statute, "enacted for the safety of employees," if, in the judgment of the petit jury the particular type which the Federal inspectors required was unsafe.

If the court's instruction were correct—if the adoption of a certain type of boiler can be held, by a jury, to be a violation of a statute enacted for the safety of employees, within the meaning of Section 4 of the Liability Act—then likewise it is a violation of the same statute within the meaning of Section 9 of the Boiler Inspection Act, which imposes a fine of \$100.00 "upon any common carrier violating this Act"; and yet it will scarcely be contended that we would be subject to fine for differing with a petit jury as to the safest type of engineering construction, especially in cases where the particular type of construction involved has been approved, or perhaps required, by the inspectors appointed under that same Act. Congress cannot be held to have commanded us to comply with the requirements of the Federal inspector, and then to have left it to

a jury to determine whether we have violated the same Act in so doing. And yet it seems clear that if the adoption of a certain design, not disapproved by the Federal inspectors, cannot be a violation of the Boiler Act for the purpose of imposing a fine, no more should it be considered a violation of the same Act for the purpose of barring the defense of assumption of risk.

It is true that the court interpolated the phrase "by reason of the negligence of the defendant" in this instruction, but this does not help the situation any, for this phrase is immediately followed by the phrase "in any one or more of the three respects alleged in the complaint." In other words, the jury are told that if the boiler was unsafe by reason of the negligence of the defendant in adopting large button heads, this would amount to a violation of the Act. It was left to the jury to determine whether the boiler was unsafe by reason of this design and whether the adoption of this design was negligent, and this in the face of undisputed testimony that these very button heads were approved by the inspectors. (Tr. p. 126.)

Moreover, it is clear that if using a boiler of a certain design, which a jury may find to be unsafe, can be a violation of the Act at all, it would be a

violation regardless of negligence, for the statute is not limited to cases where the carrier "knowingly" or "negligently" operates an unsafe boiler. Under this construction of the Act, any operation of an unsafe boiler, whether negligently done or not, would violate the statute, just as the use of a defective draw-bar violates the Safety Appliance Act, regardless of negligence, and even though the carrier did not know, and had no possible means of knowing, of the defect. Therefore, if the court's instruction is sound as given, it would be equally sound if the phrase regarding "negligence" were omitted. If such an instruction can be given at all, it can be given in words as broad as the statute. Conversely, if such an instruction would be bad if couched in the words of the statute, it follows that the court cannot make it good by interpolating any such qualifying phrase. Only Congress could alter the law in that way. It follows, therefore, that the use of the phrase regarding negligence in this instruction can have no effect either to harm or to help it.

The above considerations show that if the Boiler Act is to have any semblance of coherence and consistency, Section 2 cannot bear the broad construction which the lower court has placed upon it. The

only reasonable construction is that which would consider the Act as a whole. Taking it altogether, the Act declares that it is unlawful to operate a boiler which is not safe and fit for service, and that the Federal inspectors shall determine whether it is safe and fit for service or not. To construe it as the court has done, taking one clause of one section as though it were the entire Act, and allow a jury to determine these questions, is not only to ignore but to violate ninety per cent of the letter of the Act, and the entire spirit of it.

That there is a distinction between the Boiler Inspection Act and the other Federal statutes "such as the Safety Appliance Acts and the Hours of Service Act" which "Congress evidently intended" to include in the phrase "any statute enacted for the safety of employees" in Section 4 of the Liability Act, is evidenced by a comparison of the acts themselves. In the Safety Appliance Acts, the Ashpan Law and the Hours of Service Law, not only are specific requirements imposed upon the carrier, but the entire burden of carrying them out, and of achieving the object of the Act, is placed primarily upon the carrier, while the elaborate system of inspection provided for by the Boiler Act is not required by those Acts. These Acts create new obli-

gations, otherwise non-existent, while Section 2 of the Boiler Act contains no specific requirements at all, and creates no new obligations, but at most simply enacts the common law. This particular clause can scarcely be said to be a "statute enacted for the safety of employees," since this clause, by itself, provides no protection for them that the common law did not itself provide. It simply declares that the carrier shall not operate a boiler unless it is safe. It is only by construing this clause alone that there is any room for the construction which the lower court placed upon it, and yet if it be construed alone, it can scarcely be said to be an enactment for the safety of employees. In order to find any protection for employees, we must construe the whole Act together, and if the whole Act be construed together, it will not bear the court's construction.

As we have stated above, while the exact question presented here has not been passed upon, the principles for which we are contending has been recognized and adopted by the Supreme Court of Virginia in the following words:

"It is insisted on behalf of the plaintiff that in legal intendment the Boiler Act is not to be distinguished from the original Safety Appliance Act of March, 1893, and amendments, and the Employers' Liability Act of

1908. These latter acts have been construed by the Supreme Court of the United States to impose upon the carrier the absolute duty to provide and maintain proper couplers and other appliances therein mentioned at all times and under all circumstances. *St. L., I. M. & S. Ry. Co. vs. Taylor*, 210 U. S. 281, 28 Sup. Ct. 616, 52 L. Ed. 1061; *C., B. & Q. R. Co. vs. United States*, 220 U. S. 559, 31 Sup. Ct. 612, 55 L. Ed. 582; *Delk vs. St. L. & S. F. R. Co.*, 220 U. S. 580, 31 Sup. Ct. 617, 55 L. Ed. 590; *Grand Trunk Ry. Co. vs. Lindsay*, 233 U. S. 42, 34 Sup. Ct. 581, 58 L. Ed. 838, Ann. Cas. 1914C, 168.

"It will be observed that the safety appliances considered in the foregoing and analogous cases, either work automatically as couplers which operate by impact, or else are simple contrivances, as draw-bars and the like, which are the objects rather than the subjects of action, and when once placed in position remain intact and discharge their functions until changed by some active agency. A locomotive engine, on the other hand, however perfect its condition may be, in its operation calls for the continuous exercise of a high degree of skill and experience, and the constant supervision and attention of the engineer. In other words, the two classes of instrumentalities are so inherently diverse in character and use that rules which would be reasonable and appropriate in respect to the one class would be impossible of practical application to the other."

Virginia Ry. Co. vs. Andrews, 87 S. E. Rep. 577.

The practical difficulties resulting from the construction adopted by the lower court would make

the act grotesque and absurd. Not only would Congress be placed in the position of requiring us to adopt one form of construction required by the Federal inspectors, and then perhaps to pay a fine because this form of construction were considered "unsafe to operate," whether due to our negligence or not, by some petit jury, but after changing our construction to conform to the requirements of such a jury, the next jury might, and probably would, find that the boiler was "unsafe to operate" by reason of our adopting the very type required by the first jury. We might employ the very best experts available, and in all good faith determine on a certain type of boiler, as was actually done according to all the evidence in this case, and we may conscientiously believe, and have very good reason to believe, that we are complying with the law and have no possible means of knowing that we are not so complying, until the verdict of the jury shall determine whether or not the standard adopted was proper. The verdict of the jury would then have a retroactive effect, and *only* retroactive, for it could afford no possible protection for the future. The whole situation would be unconscionable and intolerable.

The policy of Congress, with regard to the de-

fense of assumption of risk, as manifested in the Liability Act, negatives any such intention as that which the lower court attributes to it. As this court pointed out in the *Horton* case, *supra*:

"It seems to us that Section 4, in eliminating the defense of assumption of risk in the cases indicated, quite plainly evidences the legislative intent that in all other cases such assumption shall have its former effect as a complete bar to the action. And taking Sections 3 and 4 together, there is no doubt that Congress recognized the distinction between contributory negligence and assumption of risk; for, while it is declared that neither of these shall avail the carrier in cases where the violation of a statute has contributed to the injury or death of the employee, there is, with respect to cases not in this category, a limitation upon the effect that is to be given to contributory negligence, while no corresponding limitation is imposed upon the defense of assumption of risk—perhaps none was deemed feasible."

Seaboard A. L. R. Co. vs. Horton, 233 U. S. 492; L. Ed. 1062, 1069.

As the court points out, the defense of contributory negligence is limited in all cases, and merely affects the amount of recovery, but the defense of assumption of risk is left unlimited and is a complete bar except where a statute is violated. This implies that the defense is, in general, available. And yet the construction adopted below would destroy it in all cases where boilers are involved. There

could no longer be a defense of assumption of risk in any boiler case. This would apparently leave the carrier in a more favorable position with respect to accidents on cars than on engines, and yet the intention of Congress seems to be just the opposite, as is manifested by the minuteness of its regulations with regard to draw-bars, hand holds, brakes and other car appliances.

It should be noted here that under the undisputed testimony in this case the use of the button head crown bolts on locomotive engines complies with the requirements of the Federal inspectors, appointed under the Boiler Inspection Act, the testimony showing that either type of crown bolt is accepted by them when properly applied. (Tr. p. 126.) We submit therefore that it was never intended that it should be left to a petit jury to determine whether the use of this type of boiler was a violation of the Boiler Act, either for the purpose of subjecting us to a fine or for the purpose of barring the defense of assumption of risk.

If the above reasoning is sound, and we believe that it is unanswerable, it follows that the trial court erred in its instruction above complained of and that the Supreme Court of the State of Washington erred in sustaining the verdict and

judgment based on this inspection. We believe that for the reasons given in the first part of this brief we are entitled to judgment of dismissal, but whether that be so or not we feel clearly entitled to a new trial for the reasons just set forth.

SPECIFICATION No. 7.

Instruction Regarding Contributory Negligence.

The court instructed the jury that negligence on the part of the decedent would not bar this action, but that if both parties were negligent the verdict should be reduced in proportion to the negligence of the decedent. The instruction is set forth in full in the Specification of Errors, and is the usual instruction on contributory negligence, given in actions under the Federal Liability Act.

In the present case, however, the only negligence of which the decedent was in any way accused was in allowing the water to become low in the boiler of the locomotive. There is not a shred of evidence or a word of argument even intimating that he might have been at fault in any other particular. Therefore if the jury could find him guilty of negligence at all, it could only be in allowing the water to become too low.

And if the decedent were found guilty of negligence in this respect, his negligence would necessarily be the sole proximate cause of the injury. It would intervene between any negligence which the defendant may have been guilty of, as alleged in the complaint, and the explosion. It would not be "contributory" in the true sense of the word at all. Any negligence on the part of the railway company, as any failure to install fusible plugs, could have contributed to the explosion only in a remote way, as the act of the engineer in allowing the water to become low, knowing that there were no fusible plugs to warn him, would in itself be a final, intervening, and sole proximate cause of the explosion, and would break any causal connection between any negligence of the railway company and the explosion. He himself would have had the "last clear chance" to avoid the accident.

Since the only negligence with which the decedent was charged was such negligence as would in itself be the sole proximate cause of the injury, we submit that it was error to instruct them that "even though Vance H. Thoms did not himself use due care, such is not of itself a complete bar to plaintiff's recovery if the fair preponderance of the evidence establishes that the defendant was guilty of

negligence in any one or more of the three manners alleged, and that such negligence directly caused the death of Thoms." We submit that this instruction is inapplicable to the evidence which was offered in this case, and is an erroneous statement of the law, as applied to the only acts of negligence with which the decedent was charged.

Defendant in error argued below that Instruction No. 3 covered this point, in that the court there told the jury that if the explosion were due to low water for which the decedent were responsible, the plaintiff could not recover. This would probably cover the point if it were standing alone, but when the court went on to give another instruction to the effect that negligence of the deceased (which necessarily meant the only negligence with which he was charged) might operate simply in mitigation of damages, this is absolutely inconsistent with the former instruction.

This argument involves the question whether the words "contributory negligence" in Section 3 of the Employers' Liability Act should be construed to include negligence which is the intervening proximate cause of the injury. We contend that the instruction given by the court was a misconstruction of the Federal Act, and that we are therefore en-

titled to present this question in this court and are entitled to a new trial because of the error complained of.

SPECIFICATION No. 8.

*Admitting Proof of Report of Federal Boiler
Inspectors.*

During the course of his cross-examination of one of our witnesses, counsel for defendant in error held in his hands a typewritten document from which he purported to read quotations, and asked the witness if the Federal inspectors who had inspected this exploded boiler were wrong when they made certain statements which he quoted. For instance, he asked whether the inspectors were blind or falsified if they stated "that an examination of the fire box failed to disclose any line of low water, and no evidence of overheat on the crown sheet except around the crown bolt holes where the thread showed a little blue." Reference to the transcript on pages 164 to 167 will show that counsel purported to give extensive quotations from this typewritten paper, and to ask the witness if the Federal inspectors were wrong if they made such statements.

After an objection to this line of questioning had been sustained, one of the plaintiff's attorneys

called her other attorney, Mr. James McCabe, to the stand, and asked the following questions:

Q. "Did you make application to the Federal inspectors who examined this crown sheet for their report on this accident?"

Objected to. Overruled.

Q. Did you receive that report?

A. I did.

Q. Is what I hand you now (handing witness typewritten copy) a report of the Federal Government of this accident that you received? Look it over.

Objected to. Overruled.

A. Yes, sir." (Tr. p. 168.)

He then asked counsel for plaintiff if there was any objection to the document being admitted in evidence, and being assured that there was, he did not offer the document. However, it is to be noted that after having read portions of it, the witness was allowed to testify, over our objection, that the document was the report of the Federal inspectors, and in effect, that the quotations which had been read were a portion of that report. That it was, in fact, the actual report of the Federal Boiler Inspection Department was also shown and admitted by the affidavit of counsel for defendant in error, appearing on page 231 of the Transcript.

This is absolutely contrary to the express terms of the Boiler Inspection Act. Section 8 of the Act provides that in cases of boiler accidents resulting in serious injury or death, a report shall be made by the carrier and the facts investigated by one of the inspectors, making a full and detailed report of the cause of the accident to the chief inspector, and then provides that "neither said report nor any report of said investigation, nor any part hereof, shall be admitted as evidence or used for any purpose in any suit or action for damages growing out of any matter mentioned in said report or investigation."

The action of the court in allowing Mr. McCabe to testify that the typewritten document from which extracts had been read to the jury was the report of the Federal inspectors on the accident in question, seems to be so clear and palpable a violation of this provision, that this particular specification of error should require no argument. It is true that the report itself was not admitted in evidence, but the statute provides that it shall not be admitted as evidence "*or used for any purpose,*" and this provision applies not only to the report of the inspectors, but to "any report of said investigation" and to "*any part thereof.*" Certainly it cannot be dis-

puted that some part of this report was used for some purpose in this suit.

Opposing counsel below attempted to justify the offering of this testimony upon the ground that when we objected to his using the alleged report in cross-examining our witness, we had charged him with "reading from some typewritten copy or fictitious typewritten report, not knowing where it came from, and insinuating in the question that it came from some Government official or some mechanical engineer in the East, and attempting to give the jury that idea, attempting to get it in as evidence without there being any evidence or proof of it." As it later turned out, this statement was absolutely correct, at least so far as their not having any evidence or proof of the document is concerned, for it was not authenticated in any way, and their only attempt to prove it was by asking one of the co-counsel if the document was a copy of the report that he had received from the Federal inspector. Moreover, however much this might justify what would otherwise be misconduct of *counsel* in *attempting* to prove that the document was genuine, if it really were so, it does not justify the *court* in permitting the witness to tell the jury that the copy which he had and from which extracts had been

read was a genuine copy of the report. This ruling of the court is directly in violation of the statute, and is just as prejudicial in its effect as though the document itself had been omitted, for the witness was in effect allowed to tell the jury what its contents were.

On account of this error in the admission of evidence directly contrary to the terms of the Boiler Inspection Act, the trial court should have ordered a new trial and the appellate court should have reversed the judgment.

SPECIFICATIONS NOS. 9 AND 10.

These specifications referred to the cross-examination of our witness, by reading to him alleged extracts from the Federal inspector's report on this explosion, and to the failure of the court to hold that this amounted to misconduct of counsel and a violation of the terms of the Boiler Inspection Act, and to order a new trial upon this ground.

We have already stated above that our witness, John Dowling, was repeatedly asked upon cross-examination, whether the Federal inspectors were wrong, or mistaken, or falsifying, if they stated that they could not find a low water line, and if they stated that they could find no evidence of over-

heat on the crown sheet, and if they stated that they could not account for the absence of heat on the highest part of the crown sheet and the flues, and if they stated that they were of the opinion that this was not a low water failure. (Tr. pp. 164, 165, 166, 167.) As we have seen above, it appears from the record as a fact which is binding at least upon defendant in error, that counsel was using the actual report of the Federal Boiler Inspectors in quoting these extracts. This is shown by his own affidavit. (Tr. p. 231.)

Here again we have a clear case of using the report or some "part thereof" as evidence or "for any purpose." The statute said that no part of the report should be used for any purpose in this suit. Counsel's affidavit shows that he used a part of the report for some purpose in this suit. It would seem to follow without question that the Act was violated, that we were denied the protection accorded us by the Federal Act, and that upon this ground the court should have ordered a new trial.

Counsel's justification for this course of conduct is that this provision of the Boiler Act is in the nature of a privilege; and that it was proper for him to offer privileged evidence and to compel us

to exercise our privilege in open court; and that in our opening statement to the jury we had challenged him to produce his report, and had thereby waived our privilege. We deny both of these statements.

We do not consider this a mere question of privilege. We would not be entitled to introduce this evidence, if we desired to do so, any more than the plaintiff would. It is evidently planned for the protection both of the carrier and of the employee, or of any one else who may be concerned, and is not accorded as a privilege to one side or the other. The statute declares positively that no part of the report shall be used for *any* purpose, and it would therefore be a violation even if it were used simply for the purpose of compelling the other party to object and claim a privilege.

The alleged challenge to produce this report, which we are accused of making in our opening statement to the jury, will be found on page 89 of the printed Transcript. We had just stated to the jury that we would show that various statements which the plaintiff's witnesses had made, regarding button head bolts, and crown sheets in general, were not true. We promised to submit any of our engines to their inspection, and to show that they were all tested by Federal inspectors with the hottest

possible flame, and that they did not overheat; and also to show that bolts of the type used by us had been in use for years on other railroads, and that none of them had ever dropped off, and that the men most experienced with oil burning engines had never known of a case where a crown sheet came down as a result of using this type of bolt. Then comes the statement which counsel calls a challenge, and which is as follows:

“We will show that whenever an accident of this kind happens it is reported to the United States Government and an inspection is made and reports printed and published, and that data is available so that the plaintiff can have access to it and produce it if they so desire as correct.”

We then proceeded to state that we would show that the threads alone on bolts of this character were sufficient to hold the sheet. It was not until the third paragraph beyond that we first mentioned the particular explosion which was the subject of the suit.

It is probably needless to say that the idea of challenging counsel to produce this report, or even of mentioning the fact that there was such a thing in existence as a report on this accident, was the last thing that we had in mind in using the above

language. Both before the paragraph quoted, and afterward, we had made certain general statements as to the history of button head bolts, and in the paragraph quoted we intended to, and believe we did, simply state that if this history which we had given, was not correct, and if an explosion had ever happened from the use of button head bolts, the plaintiff would have an opportunity to find out about it, because the data was contained in the Government reports and the plaintiff could have access to it and produce it (the data) if they so desired. We did not mention the explosion in question, either before or after making the above statement, and at no time was the explosion in question and the existence of a Government report spoken of in connection with each other.

Counsel for respondent may be honest in stating that they understood this at the time as referring to the report in this case, and that we were consenting to their producing it, although they have not explained why, if this was their understanding, they did not offer to produce the whole report in the first place instead of attempting to get garbled excerpts from it before the jury illicitly, in the course of the cross-examination, and without having competent proof of the genuineness of the re-

port. Counsel claims that his reason for adopting this course was in self-protection; that otherwise we might claim in our closing argument that we had challenged him to produce this report, and that he had been afraid to do so. This is rather far-fetched, for how could we make such an accusation against him when we had failed to produce it ourselves? Moreover, an instruction from the court would have made this clear to the jury, and if counsel had been acting in good faith in the matter, he would have requested us to consent that the whole report be put in evidence, without compelling us to object to it after expurgated extracts had been read to the jury.

Another reason advanced by opposing counsel as to why the judgment should not be reversed upon this ground is that we did not object to his course of questioning until after he had asked several objectionable questions. It is a sufficient reply to this to say that sometimes the attempt to keep testimony from a jury will prejudice the objecting party more than the improper evidence would if it were admitted. In this case, as the first and each succeeding question was asked, we felt that an objection at that time would do more harm than would be done by allowing the question to be asked and

answered. But the questions kept getting worse and worse, and we were finally compelled to object. However, the fact that we had allowed previous misconduct to pass unrebuked, whatever may have been the reason, is certainly no justification for further misconduct or further violation of the statute. And it should be noted that it was after we had finally objected to this course of questioning, and our objection had been sustained, that Mr. McCabe was placed upon the stand and allowed to testify that the report from which extracts had been quoted was really a report from the Federal inspectors.

And finally, respondent argues that we should have asked the court to discharge the jury, and that we had no right to continue the trial and speculate upon the verdict, and then, finding it adverse, to ask for another trial. But we submit that, after we had gone to the enormous expense of bringing many high salaried witnesses from distant states, it would be a monstrous rule that would permit our opponent to force us, by misconduct on his own part, either to wipe the slate clean and begin over again at some future date, after disclosing our whole case to him, or else to accept the alternative of submitting to his conduct without remedy. Are we not entitled to complete the trial and to speculate upon his mis-

conduct, when the misconduct was his and not ours? Are we not entitled to take our chances of securing a verdict on the evidence already offered, and to insist that if, in the ultimate result, it is found that his misconduct has damaged us, we should then have another trial?

However, whatever may be the ruling of the court upon this question, or upon the various other excuses that are given for asking these improper questions, the fact remains that no excuse whatever is offered for the action of the court in permitting Mr. McCabe to testify, in effect, to the contents of the report. Assuming that counsel were justified in construing our opening statement as a challenge to produce this report, and that their manner of producing it was perfectly fair and proper, and that their line of questioning should not be regarded as misconduct, since we had not objected to it in the beginning, and that for one or all of these reasons the conduct of counsel cannot be regarded as a sufficient violation of the act to warrant this court in ordering a new trial, still, the fact remains that after we had objected and had made our position clear to the court, *the court itself made a ruling admitting testimony* which in effect told the jury that certain extracts which had been

read were the actual contents of the Federal Inspector's report. This is not a matter resting within the discretion of the court but an absolute violation of the strict terms of the statute. It was, we submit, error of the clearest, and certainly of the most prejudicial sort, and if there were no other ground upon which we were entitled to ask this court for a new trial we believe that this alone should be sufficient.

In conclusion, may we state that it is with a most sincere conviction, not only of the inherent justice of our cause, but of the technical and logical soundness of our position, that we have asked the court to hold that judgment should be entered in our favor, notwithstanding the verdict? Whatever difficulty there may be in sustaining this position is due, rather to the complexity and technicality of the testimony, and to the difficulty of grasping it clearly, than to the existence of any actual conflict upon material issues. We believe that the action should be ordered dismissed, but if we shall fail to convince the court of this, we are confident that the court must at least feel convinced that we are entitled to a retrial of these issues, under proper instructions, and under the protection of the Fed-

eral Statute which was denied us in the hearing from which this appeal was taken.

Respectfully submitted,

E. C. LINDLEY,

Attorney for Plaintiff in Error.

F. V. BROWN,

F. G. DORETY,

Of Counsel.

IN THE
SUPREME COURT OF THE UNITED STATES.
OCTOBER TERM, 1917.

No. 172.

GREAT NORTHERN RAILWAY COMPANY,
PLAINTIFF IN ERROR,

vs.

ADALINE DONALDSON, AS ADMINISTRATRIX OF THE
ESTATE OF VANCE H. THOMS, DECEASED, DEFENDANT IN
ERROR.

IN ERROR TO THE SUPREME COURT OF THE STATE OF
WASHINGTON.

REPLY BRIEF OF PLAINTIFF IN ERROR.

The brief of the defendant in error, particularly in support of the instructions of the trial court upon the question of assumption of risk, under the Federal Employers' Liability Act and the Boiler Inspection Act (Specifications of

Error Nos. 5 and 6), brings to our attention a failure in our original brief to make clear one aspect of this question which, if it had been more fully explained, would probably have made unnecessary most of the argument of the defendant in error on this point. In order to make our position entirely clear to the court, as well as to opposing counsel, we desire to file this short reply brief, particularly upon the question of assumption of risk.

We argued, in our original brief, that in leaving it to the jury to say whether our boiler was unsafe to operate, as alleged in the complaint, by reason of the size or design of the bolt heads, the court had, in effect, required the jury to determine what type or size of bolt head was necessary in order to comply with the statutory provision, that the boiler must be "safe to operate." We argued that since the Boiler Act itself conferred this function exclusively upon the Federal Boiler Inspectors the court had erred in allowing the jury to usurp the function of the inspectors.

In reply to this the defendant asserts that the effect of our argument would be to make the certificate of a Federal boiler inspector, as to the condition of a locomotive, conclusive and binding in all cases, and would, in effect, deprive the jury of jurisdiction, in all cases for personal injuries, arising out of defective boilers, and would put an end to civil liability for such injuries, at least in cases where the inspector had previously approved of the locomotive.

In making this argument counsel overlook the fact that the determination of the type of construction which should be adopted in order to comply with a statute such as the Boiler Act, is really a legislative function, which cannot, in the nature of things, be exercised by different juries, in different cases; but this need never prevent a decision by the jury, upon any question of *fact*, because the determination of questions of fact is not a legislative, but a judicial function.

It will perhaps make this more clear, if we call attention to the fact that it has been the policy of Congress, in its rail-

road regulation, at least as to mechanical matters, to pass laws of a more or less general and, in themselves, incomplete character, delegating to the Interstate Commerce Commission, or some other body, the task of amplifying and completing the legislation and supplying the details. Thus, under the original Safety Appliance Act of March 2, 1893, requiring the installation of automatic couplers, it was left to the American Railway Association, subject to review by the Interstate Commerce Commission, to determine a standard height for the draw-bars. So, by the act of March 2, 1903, it was left to the Interstate Commerce Commission to increase the minimum percentage of cars in any train required to be operated with power brakes; and by the act of March 4, 1911 (36 Stat. L., 1397), which required that cars be equipped with secure sill steps, running-boards, hand-brakes and grab-irons, it was left to the Interstate Commerce Commission to designate the number, dimensions, location, and manner of application of these appliances.

It seems obvious that under these statutes the matter of detailing the specific requirements, and types or standards of construction, to which a carrier must conform in order to avoid a violation of the act, is strictly a *legislative* function, and one which Congress did not intend to leave to the varying decisions of different juries, either in personal injury actions, or in prosecutions for violation of the statute, and which, in the nature of things, could not be left to a jury. Thus if, under the Safety Appliance Act, the Commission had adopted a standard height of 32 inches for draw-bars, or had required a minimum of 60 per cent of the cars in a train to be equipped with power-brakes, obviously it never could have been left to the judgment of a jury to determine whether or not the Commission had exercised proper judgment, or whether a carrier, complying with these requirements, was guilty of negligence in not adopting some other height or percentage which, in the judgment of the jury, might be more safe. So, if the Commission had required

a running-board constructed of two-inch plank, or grab irons made of half-inch iron rods, and if an action should be brought under the Federal Employers' Liability Act, for injuries to a brakeman, on a car admittedly thus equipped, expert evidence should not be admitted to show that the Commission had used poor judgment, and that the running-board should be 3 inches thick, and the jury should never be instructed, in such a case, that if, in their judgment, the specifications adopted were not "secure," and were therefore in violation of the statute, the employee would not assume the risk.

Even if we were to suppose an action arising during the interim between the passage of the statute and the adoption by the Commission, of its specific requirements, it seems clear that the functions of the jury could not be any more extensive by reason of the fact that the Commission had not yet made its findings. If we are correct in asserting that the determination of these standards of construction is essentially a legislative function, a carrier could not be held *in violation of the statute*, for not complying with some jury-made requirement determined upon in a subsequent personal injury action. If the Commission has not yet acted, the statute cannot be said to be complete, and the carrier cannot, of course, be held in violation of a statute which has not yet been completed in such a way as to cover the alleged violation.

In our judgment, the boiler inspection act is entirely analogous to these statutes. Its ten sections, occupying six printed pages of the pamphlet, deal almost exclusively with the appointment, powers and duties of the boiler inspection department, and the brief requirement in section 2 that the "boilers and appurtenances must be in proper condition and safe to operate in the service to which the same is put," is the only clause which could be construed as imposing directly upon the carrier, without the intervention of the inspectors, any obligation with respect to the type of construction of

their engines. It seems clear that in providing for the appointment of inspectors, and leaving it to the inspection department to prepare or to approve all needful rules and regulations, subject to approval by the Interstate Commerce Commission, and to remove from service boilers not in their judgment complying with the requirements of safety in operation, Congress delegated to them, as it delegated to the Interstate Commerce Commission and other bodies under the earlier statutes, the legislative function of amplifying the act, leaving it to their discretion to say what specific requirements should be imposed upon the carrier and, conversely, what specific requirements should not be imposed. The provision of section 9, that any common carrier violating the act, or any rule or regulation made under its provisions, "or any lawful order of any inspector" shall be liable to a penalty of \$100, makes it clear that the orders of the inspectors are to have the sanctity of law.

The instruction given by the trial court would mean that the phrase "in proper condition and safe to operate" as used in the statute, requires that the boiler must be built with such type and size of bolt-heads as would, in the opinion of the jury, be safe construction; or, substituting the meaning adopted by the court, for the phrase itself, the statute would read to the effect that it shall be unlawful for a carrier to use an engine unless it is equipped with such size and type of bolt-heads as a jury in a subsequent personal injury action shall adjudge to be safe. Fantastic as this sounds, it is exactly and literally the effect that the instruction of the trial court would put upon the act. Obviously, if every jury which ever sits in a personal injury action, arising from an explosion of this character, is to be allowed to form its own standards, and hold us *in violation of a statute* for failure to comply with a subsequently adopted jury-made standard of construction, chaos would reign.

It would not follow from this, however, as argued by opposing counsel, that an action for personal injuries from

a defective boiler would never lie, or that a certificate of an inspector would be conclusive in all cases. Our argument applies only to the matter of adopting a design, or a standard of construction, which is, or ought to be, of general application, and applicable to future operation. This is a legislative function. But a finding of fact in an individual case, as to whether a certain part is broken, or otherwise defective, or whether a given engine is constructed according to certain required specifications, is not a legislative function at all, but is judicial in its nature. Many such findings of pure fact must necessarily be made by the inspectors, and such findings cannot be regarded as amplifying the statute, or as a part of it. Congress itself could not, in any given case, by its most sacred enactment, make a determination of fact as to whether a defect existed in a given case, which would be binding upon the parties to a controversy, for this would not be due process of law, and obviously, a power which Congress itself does not possess, it cannot delegate to a subordinate body.

It follows that personal injury actions could arise, and the jury would have jurisdiction under our construction of the Boiler Act, to exactly the same extent as under the Safety Appliance Acts, and kindred legislation. Just as an employee could recover by reason of a flaw in a draw-bar, even though the same were of the standard height, so he could recover by reason of a flaw in a bolt-head or a piece of boiler plate, even though the same were constructed of a size and thickness which might have been theretofore specifically required by the inspectors. And, of course, if it should happen that the inspectors had in fact required a given size or thickness, the jury could in any case hold the carrier in violation of the act for not complying with the requirement. And in such a case the jury should be governed by the evidence before them, even though, as to the identical engine in question, the inspectors might have found that the bolt-heads were of the size which they had required; for this would be

a judicial question, upon which they could not conclude the court or the jury.

Counsel for defendant in error have cited and quoted a large number of cases, principally from New York, to the effect that the certificate of an inspector is not conclusive upon the jury, and we are not disposed to quarrel with any of those decisions, for they all involve mere questions of fact. There is no case cited, however, in which a jury has been permitted to find a *violation of a statute*, based upon a failure to comply with some size or type of construction determined upon by themselves, where that function had previously been confided to some subordinate agency of the legislature.

It should be noted that in this part of our discussion, we are not necessarily contending that a jury might not find a railway company guilty of *negligence* for adopting an improper type of bolt head. This might be negligence, although it would not be a violation of the Boiler Inspection Act. All that we are arguing here is that this would not be a violation of the Boiler Act, and therefore the defense of assumption of risk should not be barred. Whether the jury could return a verdict of negligence against us is an entirely different question, and one that we have argued in our original brief.

Counsel argue that it does not appear in the record in this case that the Federal inspectors had ever approved, much less required, the large size button-head used by us. As a matter of fact it does appear, on page 126 of the transcript, that the Federal inspectors had approved both the large and the small size of bolt-heads. However, it follows from the foregoing argument that it is entirely immaterial, whether the large bolt-head had been approved or required, or not, so long as no other size had been required, and the large bolt-head had not been disapproved. For the omission by the inspectors to require the adoption of any given type of construction, must be regarded as the deliberate omission of such requirement from the statute. In other words, the statute

must be construed as though it specifically incorporated each requirement that the Federal Inspection Department adopts, and deliberately omitted any mention of such requirements as they omit. And this being so different juries cannot be permitted to amend the statute, by including matters thus omitted by the inspectors.

Counsel cite the annual reports of the Chief Boiler Inspector to show that it is not his policy to make such specific requirements, but that he prefers to place upon each carrier the entire responsibility for adopting its own standards of construction. But by that very report he exercises the discretion reposed in him by Congress, and declares the legislative intent that such detailed specifications shall not be regarded as part of the statute. Congress has left it to his department to say what specific requirements shall be made, and, conversely, of course, what requirements shall be omitted; and if he determines that a given type is not required in order to conform to the statutory requirement of safety in operation, it is as though the statute itself had thus spoken, and the jury cannot alter this.

Counsel assert, on page 52 of their brief, that the record shows that *since this explosion* the inspectors have recommended a change in our bolt-heads. It is true that Mr. McCabe testified: "*I understand* that the Government has recommended that the Great Northern change their bolt-heads." But immediately following this, on page 82 of the transcript, he states that he has never seen the Government reports and does not know what they do require. What he "understands" is, of course, no proper showing as to what recommendation has actually been made, and if it were, it only points to a finding made *since the explosion occurred*. The inspectors' only action *before* the explosion, as shown by the record, was to approve both types.

And, finally, counsel insist that our entire argument is inapplicable in the case at bar, or, rather, that it tends to support their position, for the reason that they offered evidence

that our bolt-heads had become insulated and crystallized, and the material deteriorated, and that under our own admissions, the existence or non-existence of these defects was a question of fact within the jurisdiction of the jury, and that the jury might have found a violation of the boiler act by reason of these defects.

It is true that the plaintiff offered expert opinion evidence that our bolt-heads would pull away from the crown sheet, leaving openings in which insulation would form, and the witnesses also stated that in some indefinite period of time, which might run anywhere from five minutes to twenty years, the material would *tend* to become deteriorated, and to crystallize; but, as we have shown in our original brief, they offered no evidence that this tendency had been consummated, or that any of the button-heads on this particular engine had, in fact, become insulated, crystallized or deteriorated at the time of the explosion. However, even if we assume that such evidence was offered, and that the bolt-heads were in fact defective, and if we grant that under the law, as construed by us, the jury might properly have found us in violation of the statute by reason of such defects, and might properly have eliminated the defense of assumption of risk, on that ground, still the answer to all this is that *that is not the question which the court left to the jury*, in the instruction that we are complaining of. The court did not tell the jury that if they found our boiler was unsafe by reason of any *defects*, then the deceased engineer did not assume the risk. What the jury were told was that if they found the boiler unsafe *in any of the respects alleged in the complaint*, the deceased could not be held to have assumed the risk.

Now, whatever *defects* the *evidence* may have shown in our bolt-heads, the *complaint* did not allege any insulation or crystallization or any deterioration or defect of any kind whatever in these bolt-heads. The only allegation in the complaint regarding bolt-heads is that they were "excessively and unnecessarily large"—in other words, that the type or

design was unsafe—and their witness Pierron, at least, supported this with his testimony, quoted upon page 20 of our original brief, that bolt-heads of this size were dangerous, regardless of crystallization, as they would “get red-hot every time the engine goes out on the road,” and “I do not think you could * * * run an engine with the type of head like the No. 1 bolt here (our type) without getting it red-hot with an oil-burner.”

It follows, then, that what the court told the jury, in effect, was, that if they found this size or design unsafe—that is, if they found that some other design ought to have been adopted as an engineering standard—this would amount to a violation of the statute and would bar the defense of assumption of risk.

It is entirely immaterial, therefore, whether, in addition to this allegation in the complaint, and the evidence just quoted in support of it, there was some *additional* evidence of a *defect* which the court might *properly* have submitted to the jury. The fact remains that it *improperly* submitted the question as to the *type of construction* which should be required in order to comply with the statute, and that it therein committed error—and an error which in our very earnest opinion, leaves the judgment under review entirely worthless, and would require a new trial, unless the court shall find that our motion of judgment notwithstanding the verdict should be granted and the action dismissed.

Dismissal for Insufficient Evidence.

Upon this question there is little in the brief of defendant in error to call for a reply. We argued in our original brief that the record was entirely devoid of any evidence whatever that a defect existed in the locomotive at the time of the explosion, and also that it was devoid of either evidence or opinion as to what caused the explosion, with the one exception of the witness Pierron who testified that some bolt-heads in the possession of the plaintiff's attorney, and which were

assumed, but not shown, to have come from the engine in question, and were not produced, were crystallized, and also that in his opinion the explosion was due to the size and type of bolt-heads used.

Counsel's only reply to this argument is their assertion on page 25 of the brief that there *was* evidence that a defect existed, and that it *did* cause the explosion; and their single reference to the record in support of this single reply to our argument, is to the pages of the transcript upon which appears the testimony of the witness Pierron which we have just referred to. This, we submit, is to concede our contention that there is no evidence in the record upon which a verdict could be based, unless it be the testimony of Pierron brought out on our own cross-examination and which we quote extensively on pages 18 to 20 of the original brief.

We argued there that this testimony places the responsibility for the accident upon the size and type of our bolt-head and not upon any defect. Counsel disputes this without pointing out wherein we are in error, and we leave that question to be determined by the court upon the record.

We then proceeded to argue that such a mere difference of expert engineering testimony upon a question of standard mechanical construction is not evidence of a "defect" upon which a jury can base a finding of "negligence" within the meaning of these terms as used in the Federal Liability Act.

In reply to this counsel impute to us the contention that *usage or custom* among railroad companies is a sufficient defense to a charge of negligence, and having set up this man of straw, they proceed to cite the well-known cases of this and other courts repudiating that doctrine. It is true that we offered the testimony of officials of nearly all of the great oil-burning roads of the West to prove that the size and type of bolt-heads used by us was the safest known, and incidentally and largely for the purpose of qualifying these witnesses, we showed that bolt-heads like ours had been in use upon their roads and that they had had a great deal of experience with

them on oil-burning engines for periods up to ten years. It seems needless to point out that this evidence was not offered in an attempt to justify our practice upon the ground of common usage, or to say that we make no contention whatever that mere usage or custom will justify negligence, either in a mechanical matter or otherwise.

The rule of law which we rely upon, to the effect that a standard or type of mechanical or engineering construction, well known and much used, and adopted after thorough test and observation, and upon expert engineering judgment, cannot be a "defect" within the meaning of the statute, is an entirely distinct proposition of law from that which counsel for defendant in error impute to us, and which they have so successfully demolished. We need merely point out that if their judgment is applicable and sound in opposition to our contention, then this court must share our condemnation by counsel, and the instruction from *South. Pacific Company vs. Seley*, 142 U. S., 145; 14 Sup. Ct. Rep., 530; 38 Law Ed., 391, which we quote upon page 25 of our brief, must go into the discard. If we substitute the words "large and small bolt heads" for the words "the blocked and the unblocked frog" in that instruction, it would be an exact statement of our position, which is as follows:

"The jury are instructed that if they find from the evidence that the railroad companies use both the (large and small bolt-heads), and that it is questionable which is the safest or more suitable for the business of the roads, then the use of the (large bolt-head) *is not negligence*, and the jury are instructed not to impute the same as negligence to the defendant, and they should find for the defendant."

If the above is still the law, and if counsel are able to point in the record to no evidence of a defect or negligence other than the difference of opinion of the witness Pierson as to our standard type of bolt-head, it seems clear that our motion

for judgment notwithstanding the verdict, must be granted upon this ground.

We also urge our motion to dismiss upon the entirely separate and distinct ground that the undisputed facts conclusively showed that the crown sheet was red hot at the time of the explosion, it being conceded that the crown sheet could become red hot only through the absence of water upon it, and that this could be due only to the sole negligence of the deceased engineer, for whose death this action is brought. We tried to show that the stretching and distortion of the crown sheet showed some seven or eight different manifestations which could only be produced upon red-hot metal, and we cited authorities to show that where, according to well-known scientific laws, the admitted physical facts could not exist except upon a given hypothesis, such as that the steel was red hot, the conflicting narrative testimony of an eye witness could raise no issue of fact.

Counsel for defendant in error seem to concede this rule of law, except that they cite authorities to qualify it to the effect that it does not apply except where the facts are very clear and the scientific laws very well established. We accept this qualification, but we insist that our record complies with these requirements.

If we assume that instead of having a crown-sheet which has become sagged and quilted between the bolts which supported it, and which has become stretched and drawn out until it is four or five inches longer and one-third thinner than it originally was, we had produced a block of steel with a dent half an inch deep made by a hammer, what would be said as to the testimony of an eye-witness to the effect that he had struck the steel with a hammer, and had driven the hammer half an inch deep into the block, and that it was not red-hot, but was cold and normal at the time? We submit that if the steel block were produced and the depth of the dent admitted, the testimony of the eye-witness would be found in irreconcilable conflict with the well-known

scientific law that iron must be heated to a very high temperature before the blow of a hammer will penetrate it in this way; and yet that scientific law is no better known and the physical facts are no better established in the hypothetical case, than they are in the record which we produce in this court. It is not disputed that this steel boiler plate actually sagged between the bolts before giving way, and that in giving way it was actually stretched out as much as five inches and reduced one-third in thickness, without rupturing the affected metal in any way. Expert metal-workers testified, and the court knows of its own knowledge, that neither these things nor half a dozen other manifestations which appeared upon this crown-sheet could happen unless the metal were red-hot. The eye-witness tells us that the metal was at its normal temperature, or, what amounts to the same thing, it had water upon it; but we submit that this is no more to be believed than would be the testimony of the man who claimed to have driven a hammer half an inch deep into cold steel.

Counsel suggest that a boiler explosion is a complicated phenomenon not subject to well-established and simple laws such as were invoked in the cases which we have cited in our brief; but we reply that we are not relying upon the laws governing boiler explosions, but upon the simple and well-known physical law which every school boy knows, that a steel plate cannot be rippled and stretched out and thinned down without a rupture of the fibre of the metal, unless it is first made red-hot.

Counsel also argue that the jury could *see* the amount of this distortion, since the crown-sheet was produced before them, and that therefore the court should take their finding as conclusive. However, seeing the crown-sheet does not eliminate the possibility either of mistake or prejudice. That this court cannot see the crown-sheet does not alter the fact that the character and extent of the distortions appear clearly in the record, and are undisputed. It is stated repeatedly

that the crown-sheet was stretched out five inches one way and four inches the other, and that it was reduced one-third in thickness, and that it had sagged down between the bolts, which were only four inches apart, and the various other distortions were minutely described in the testimony, *and none of them were questioned or disputed by any witness.*

We submit, therefore, that upon this ground alone, if not upon the ground of the plaintiff's failure to produce any evidence of a defect, the motion for judgment, notwithstanding the verdict, should have been granted.

Counsel seem to misunderstand the relation of this portion of our argument on the question of low water, to the argument upon the question of insufficiency of the evidence. They put the whole matter as one alternative question; that is, was the explosion due to poor bolt-heads or was it due to low water, implying that if it was not due to low water—if we are not convincing on this portion of our argument—it would follow that it was due to poor bolt-heads? This by no means follows. If by the testimony of their eye-witness, the fireman, it shall be held that they have effectively negatived low water as a cause of the explosion, the burden still remains upon them to show what the actual cause was. Besides negativing the low water as a cause, they must go further and produce some competent evidence as to what the actual cause was, and show that some defect existed, and that it caused the explosion. Unless they have accomplished both these things their case must fail; and we submit that they have accomplished neither.

In our discussion of the remaining specifications of error we seem to have anticipated all of the arguments that counsel have presented, and we believe that our original brief will serve as an effective reply to the remaining portions of the brief of defendant in error.

We respectfully submit that the decision of the Supreme Court of the State of Washington should be reversed, and

the action dismissed or, if we have failed to convince the court of this, that a new trial should be awarded under proper instructions.

Respectfully submitted,

E. C. LINDLEY,
Attorney for Plaintiff in Error.

F. V. BROWN,
F. G. DORETY,
Of Counsel.

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No. 172

In the
Supreme Court of the United States
October Term, 1917

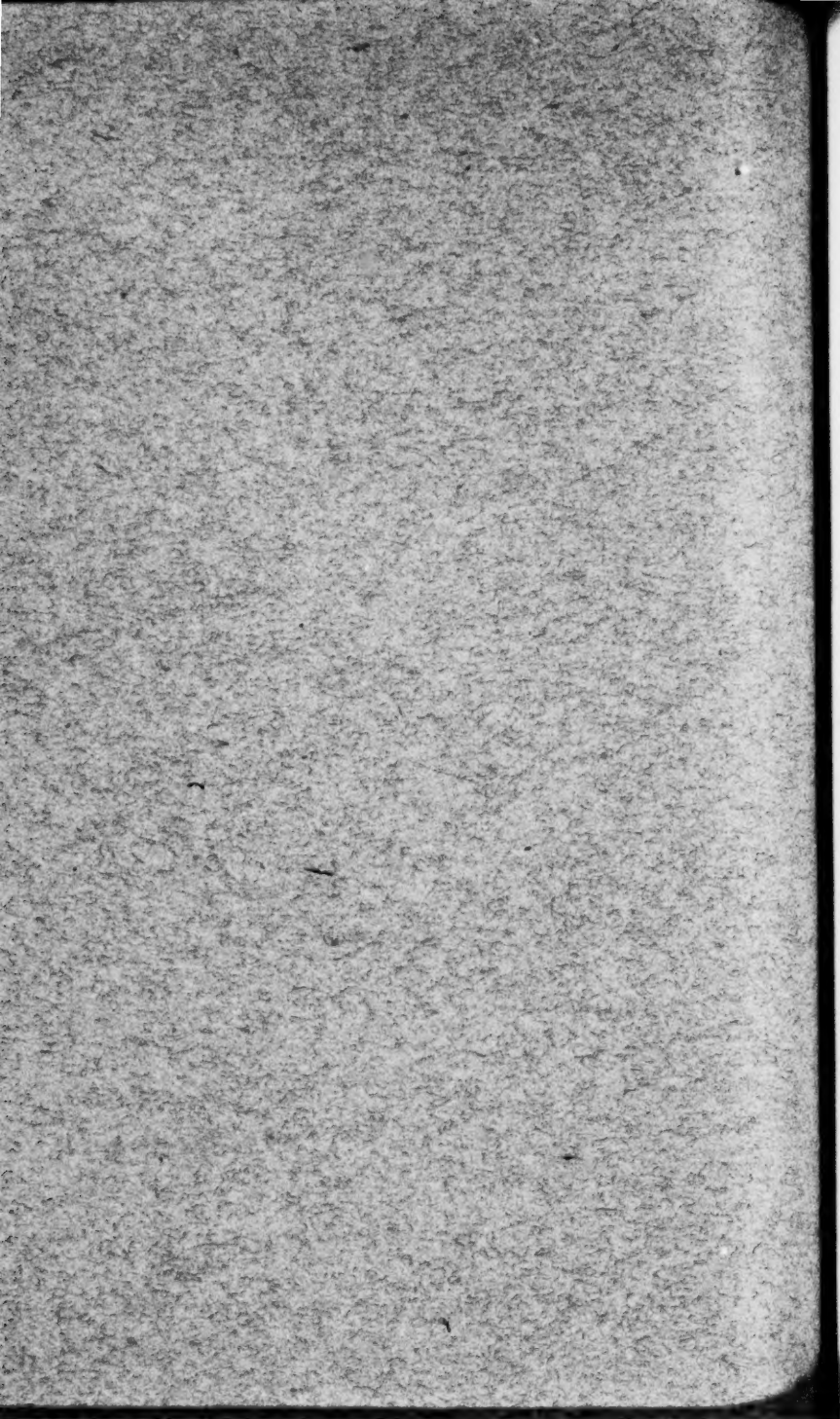
GREAT NORTHERN RAILWAY COMPANY,
Plaintiff in Error,
vs.

ADALINE DONALDSON, Administratrix,
Defendant in Error.

In Error to the Supreme Court of the
State of Washington

BRIEF OF DEFENDANT IN ERROR

JAMES McCABE,
HYMAN ZETTLER and
JOHN C. HIGGINS,
Attorneys for Defendant in Error.



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In the
Supreme Court of the United States

October Term, 1917

No. 172

GREAT NORTHERN RAILWAY COMPANY,
Plaintiff in Error,

vs.

ADALINE DONALDSON, Administratrix,
Defendant in Error.

In Error to the Supreme Court of the
State of Washington

BRIEF OF DEFENDANT IN ERROR

We regard the plaintiff in error's statement of the evidence and of the various issues and contentions of the parties below to be so incorrect and misleading that we are impelled to disregard it entirely. Without, therefore, correcting each misstatement in plaintiff in error's brief, we proceed to state the case anew.

SUFFICIENCY OF THE EVIDENCE.

SPECIFICATIONS 1, 2, 3, 4.

This is an action under the Federal Employers' Liability Act. A dependent mother sues for the death of an engineer. The deceased was scalded to death by a locomotive boiler explosion which took place through the "coming down" or bulging of the iron sheet between the fire box and the water in the boiler (called the "crown-sheet").

While the manner in which the explosion occurred was not in dispute, the whole controversy below centered around the cause of the "coming down" of the crown-sheet. The contention of the railway company throughout was that the crown-sheet came down because of the negligence of the deceased in allowing the water in the boiler to become too low. The plaintiff denied that this was the cause. Her contention was that the failure of the crown-sheet was caused by the giving way of defective bolt-heads. This engine had been changed by the defendant from a coal-burner to one using oil as fuel. When this change was made the railway company failed to change the bolt-heads on the fire side of the crown-sheet. The bolt-heads as

used in the Great Northern coal-burners were comparatively large (Fig. 1, Plaintiff's Exhibit "A"), and the testimony on behalf of the plaintiff was that, owing to the much higher temperature of the oil flame as compared with the coal, it was dangerous to continue to use such a bolt-head because of the excess of material it contained. A bolt-head with so much surplus material, according to plaintiff's experts, became overheated and weakened when subjected to the high temperature of the oil flame so as to result ultimately in the explosion. (Tr. 23, 26, 27, 31, 33, 34, 35, 38, 47, 51, 55, 56, 69, 74.) Testimony was also introduced on behalf of plaintiff that from certain indications observed by plaintiff's witnesses on the crown-sheet after the explosion, "scale" was allowed by defendant to accumulate in the boiler to such an extent as to contribute to the explosion. (Tr. 49, 72, 24.)

This, then was the paramount issue of fact: Did the crown-sheet come down because of low water (due to the negligence of the deceased) or because of the defective bolt-heads and contributory accumulation of scale?

In support of the railway company's theory that the explosion was caused by the negligence of the

deceased in allowing the water to become too low (the universal defense—it may be interjected—in this sort of a case) the railway company's experts all gave their opinion that from the physical indications on the crown-sheet the explosion could only be due to low water. But the only direct evidence on this issue was that of the railway company's employee, Thomas Hansom, the fireman on the engine at the time of the explosion. His testimony was clear and unequivocal that there was plenty of water in the boiler at the time of the explosion. (Tr. 10, 11, 18.) The fact that this was not a low-water failure was further substantiated by the important fact of the absence of a blue color on the crown-sheet. As was expressly admitted by one of the railway company's most important witnesses, if the crown-sheet was not blue, then the explosion was *not* caused by low water. (Tr. 167.) The testimony of plaintiff's witnesses was that such a color, if present on the crown-sheet after the explosion, would still be observable at the time they examined the crown-sheet after the explosion and could also be seen at the time of the trial. It was conceded by all that the sheet was not blue at the time of the trial. Whether it was blue after the explosion and whether it would lose its color (if any) between the

time of the explosion and the trial was as positively denied by plaintiff's witnesses as it was affirmed by defendant's. (Tr. 22, 49-50, 59, 71, 194.)

This is then the situation: The railway company's experts examined the crown-sheet at the time of the trial. They observed certain distortions on it. (It may be remarked in passing that, as the record shows, the crown-sheet was before the jury who could observe the extent and significance of such distortions and thus check up the value of the experts' testimony, which this court in the absence of the crown-sheet cannot do.) The *inference* that the railway company's experts drew from these distortions (the extent of which, we repeat, was found by the jury from an inspection of the crown-sheet which is not before this court) was that the explosion was caused by low water. Now obviously the validity of this inference depended upon the degree of heat which distorted the crown-sheet, for the distortions were simply symptoms of overheating. It is a matter of common sense (which the jury had the right to use) that the amount of distortion would vary with the amount of heat applied to the crown-sheet. Therefore, the jury, with the distorted crown-sheet before them, were not bound by the railway company's inference that the degree of heat neces-

sary to produce the observed distortions could only be accounted for by the theory that there was no water in the boiler. On the contrary, the jury had the right to infer that the observed distortions was due to the force of the explosion itself and to accumulations of "scale" between the crown-sheet and the water. The testimony submitted by plaintiff was ample, if believed, to establish the fact that such "scale" is a non-conductor of heat and that it must have been present upon the crown-sheet in question at the time of the explosion. (Tr. 24, 60, 61, 72, 190.) We must not forget that the jury had to consider, in determining what caused the distortions on the crown-sheet, the part played by the force of the explosion itself. This is not a case of disregarding the testimony of a man that he did not see an approaching train when the physical facts are that he looked at the train, which was in plain view. Nor is it one wherein it is contended that a certain thing happened in unmistakable defiance of a *well known* and *undisputable* scientific law. An examination of the authorities shows that the courts have very rarely, and then only in the simplest of cases, set aside verdicts on the ground that they are contrary to scientific principles. The reasons for this reluctance are well stated in a note (7 L. R. A. N. S. 357) to one of

the cases cited by the railway company:

"It must be borne in mind, however, in the first place, that there is no presumption that the members of the appellate court are any better informed than the members of the jury which returned the verdict as to the working of the laws of nature. Admitting, however, the superior capacity of the appellate court to deal with scientific principles in the abstract, such a court might well hesitate to overturn, upon the ground that it is contrary to scientific principles, a verdict sustained by the testimony of apparently disinterested eye witnesses purporting to state what they actually saw, for the reason that there may have been some fact or circumstance not apparent from the record, or, perhaps, not shown even on the trial, that, if shown, would have reconciled the testimony of the eye witnesses with the scientific principles applicable to the subject. To set aside a verdict sustained by the testimony of apparently disinterested eye witnesses whom the jury have credited involves, first, the assumption of the correctness of the appellate court's understanding of the scientific principles applicable to the facts as shown by the record, and, secondly, the assumption that all the facts which could affect the question are before the court. Ordinarily, of course, an appellate court is entitled to base its decision upon the showing made by the record; but, if the court undertakes to go outside the record and test the verdict by reference to scientific principles, it would seem that it cannot properly close its eyes to the possibility that there may have been a fact or circumstance, not disclosed by the record, which would reconcile the testimony of the eye witnesses with scientific principles—at least, unless the facts and

circumstances as shown by the record are such as reasonably to repel the existence of any other fact or circumstance which could affect the matter."

As stated on this point by the Supreme Court of Wisconsin (whose earlier decisions are cited in the railway company's brief), "This proposition" (that the testimony of an eye witness is in contradiction of known physical law) "must be supported by *demonstration*, not by mere conflict of evidence. All the necessary data for demonstration must appear affirmatively *and not depend upon mere credibility of other witnesses.*" (*Winkler vs. Company*, 124 N. W., p. 275.)

As further stated in one of the cases cited by the railway company (*Sheppard vs. Company*, 108 Pac. 819) :

"In the case at bar the undisputed physical conditions surrounding the plaintiff at the time he received his injuries furnished a strong argument against the credibility of his testimony, but this is as far as the record authorizes us to go. Where there is some evidence tending to support a verdict, to justify an appellate court in overturning it on the ground that it is contradicted by the *settled and unquestioned* laws of nature or by some established principle of mathematics, mechanics, physics, or the like, *the undisputed physical facts must demonstrate beyond any reasonable doubt that the evidence*

is false, and that the verdict is without support in fact or law."

We do not apprehend that counsel at bar will have the hardihood to contend that the physical laws which operate when a modern locomotive boiler explodes are so unquestioned and established that the precise cause of the explosion can now be demonstrated beyond reasonable doubt upon the record before this court, and in the absence of the crown-sheet, which the jury had before it. Indeed, as the State Supreme Court in this case held, the scientific laws governing boiler explosions in modern oil burning locomotives have yet to become settled and undisputed. They have, as yet, not been so thoroughly established as to demonstrate beyond a reasonable doubt that the condition of a particular crown-sheet could mean a low water failure and nothing else. Of course, the railway company's experts gave their opinions that this could be the only cause, but they were emphatically disputed by the plaintiff. (Tr. 71, 49.) Certainly the opinions based upon their previous experience depended upon the credibility of their evidence and furnish no adequate grounds for the application of the rule invoked by the railway company.

We can readily see why the jury adopted the

views urged by plaintiff when we consider some of the other salient facts bearing upon the correctness of the railway company's inference that the distortions were produced solely by a lack of water in the boiler.

The admittedly infallible indication of the extremely high temperature of a crown-sheet which comes down because of low water, was, according to plaintiff's evidence, entirely lacking.

As agreed upon by all in the case at bar, the distinguishing trace left by an explosion due to lack of water is the deep blue color left on the crown-sheet. "If," as one of the railway company's principal witnesses testified, "there was no blue color on that crown-sheet, the explosion was *not* due to low water." (Tr. 167.) And the testimony submitted by plaintiff fully established, if believed, this determining factor; that is, the absence of such a blue color. (Tr. 22, 49, 50, 71, 194.)

We must also bear in mind that the jury could compare the distortions produced on crown-sheets, which failed through lack of water, as shewn on the photographs introduced by the railway company's experts (Ex. 13, 14, 15, 16, 17, 18), with the extent of the distortions on the crown-sheet before them.

Indeed, the contrast between the extremely distorted and *torn* crown-sheets in those low water failures and the crown-sheet in question was so startling as to cause astonishment at the railway company's contentions.

What probably was a powerful factor in convincing the jury was that the only *direct* evidence as to the question of sufficiency of water was in forceful and unequivocal contradiction to the inferences reached by the railway company's experts. The jury was evidently not willing to attribute deliberate perjury to a *disinterested* and convincing eye witness, especially when such witness was then in the employ of the defendant railway company. (Tr. 9.)

May we not add that our confidence in the justice of the unanimous decision of the jury is greatly enhanced by the refusal of the trial judge to grant a new trial? As was strenuously urged to the presiding judge, who was in a position to appreciate the atmosphere of the trial, it was his duty under the Washington law (Clark vs. the present plaintiff in error, 37 Wash. 537; 79 Pac. 1108) to grant a new trial if he found that the preponderance of evidence (although conflicting) was against the verdict.

Indeed, the evidence supporting the plaintiff's case at bar was much more specific and a great deal stronger than is usually produced by successful plaintiffs in locomotive boiler explosion cases. This is demonstrated by examining the parallel boiler explosion cases of *R. R. Co. vs. Prickett* (Ill.), 71 N. E. 435; *R. R. Co. vs. Behrens* (Ill.), 69 N. E. 796; *Gill vs. Brown* (Tenn.), 169 S. W. 752; *Findley vs. Ry. Co.* (W. Va.), 78 S. E. 396; *Marceau vs. R. R. Co.* (N. Y.), 105 N. E. 206; *Ry. Co. vs. Davenport* (Tex.), 117 S. W. 790, and *Hough vs. Moreland* (Ky.), 169 S. W. 467.

At bar the railway company's entire argument in regard to plaintiff's charge of defective bolt-heads is founded upon an utter misstatement of the record. The railway company bases its entire argument on the thought that there was an issue between the different "types" of bolt heads, each of standard construction; that is, between the so-called "button-heads" and the "taper-heads." But as we made it clear, first, to the trial judge and then to the Supreme Court of Washington, that issue is a purely imaginary one conjured up by counsel for the railway company in an attempt to present an otherwise hopeless attack upon the jury's verdict. A very summary review of the evidence and issues in the record at bar

will, we believe, suffice to dispose of the railway company's entire argument on this question of defective bolt-heads.

Plaintiff had three experts: one a technical expert, who had made a special study of steam engines and boilers (Tr. 21, 24-6); another, a man in the employ of the federal government and who has been a practical boilermaker for more than thirty years, having worked for numerous railroads in that capacity (Tr. 46); and the third, a practical locomotive engineer, who had worked for thirteen years for railroads all over the country, especially for the principal oil-burning roads. (Tr. 69.) In plaintiff's Exhibit "A," Fig. 1 represents the bolt-head (exact size) used in the engine. The grievance of plaintiff, as stated in her complaint, was "that the button-heads of the crown-bolts of said boiler were excessively and unnecessarily large for the intense heat of the oil flame." (Tr. 2.) The testimony of plaintiff's witnesses directly supported this allegation and showed (going into details) that the use of so much excess material in the bolt-head with the intense heat of an oil flame resulted in its being "burned" and weakened so that an explosion followed. (Ab. 23, 26, 27, 31, 33, 34, 35, 38, 47, 54, 55, 56, 69.)

To support this testimony and show that a safe bolt-head, without this excess material, could have been used, plaintiff presented to the jury Fig. 3, Exhibit "A," the "taper-head" type of bolt-head. *This was not done to advocate that the "taper-head" type was better than the button head type (each "type," according to defendant's evidence, having the required factor of safety)—but to show that the standard head as used on the really large oil-burning roads was one in which the dangerous excess of material in the bolt-head was eliminated.*

Plaintiff's witnesses, who had had much practical experience with locomotive boilers, testified, in severe criticism of the railway company's bolt-head, that the Great Northern bolt-head contained the greatest amount of metal of any head they had ever seen used on oil-burning engines. (Tr. 47, 71.) They further testified that the No. 3 "taper" type of bolt-head (without the excess material) was the one generally used in oil-burning locomotives. (Tr. 47, 52, 71.) Indeed, it was the railway company's evidence itself which really demonstrated beyond a reasonable doubt the correctness of plaintiff's contentions upon this point. At first defendant's experts resorted to quibbling in regard to the taper-head bolt. (Tr. 135, 161, 183.) They stated that

the head illustrated by Fig. 3 was never used, but it developed that this was said because the exact number of threads was not correctly depicted upon the drawing! When answer was compelled of the vital question—the comparative amount of material in the various bolt-heads—it appeared, exactly in accordance with plaintiff's contention, that the standard head of the great oil-burning road of this country—Southern Pacific System—was *one approximating Fig. 3 in the amount of material.* (Tr. 193.) This was graphically presented to the jury by having the witness draw the Southern Pacific head over the Great Northern head (see Fig. 5, Pltff's Ex. "A"). And the same proved true of the other oil-burning roads (it being remembered that there are not many oil-burning roads in the country and that of these, both fuels are used. (Tr. 52.) For example, defendant's witness was compelled to admit that the No. 3 ("taper") head was "*the*" head of the Santa Fe System. (Tr. 132.) This was in strict accord with plaintiff's evidence, it being shown *that when the Santa Fe road changed from coal to oil, it took the precaution, which the Great Northern in this case did not, of drilling off the surplus material from its bolt-head.* (Tr. 57.) No attempt was made to dispute the fact that the Milwaukee System use the taper (No. 3) bolt-head.

It was stated by defendant's witnesses, however, that while the "taper" type was the standard head of the Southern Pacific and Santa Fe roads, the "button-head" type was also used (although the extent of its use was not stated). It was also testified that the "button-head" type was in use in the smaller Oregon Short Line and Spokane, Portland & Seattle roads. *This is but one important instance out of many which clearly showed to the jury and trial court the true worth of all the railway company's testimony.* It persisted throughout in attempting to confuse the issue. Instead of addressing itself to the true issue—whether the bolt-head as used in the engine in question contained excess material—they substituted the question of whether the "taper," or "button-head" types was better, or, differently stated, whether the button-head type of bolt-head was unsafe. There was no particular quarrel with the "button-head" as a type, but there was a serious objection to the particular bolt-head when it had so much excess material as the one in the engine which exploded. When, therefore, the railway company's counsel, in its brief, and its witnesses on the stand below, sought in this manner to dodge the real issue, the result is nothing more than a serious reflection on the merits of the defense.

The weakness of defendant's evidence was made painfully apparent to the court and jury when, for instance, the witness from the Oregon Short Line, after testifying that they used the "button-head" *type*, blankly refused to mark the *size* over the drawing of the Great Northern button-head (Pltff's Ex. "A"), so that the jury might compare the amount of material in each and arrive at a determination of the real issue. (Tr. 138.) His infantile reason that he didn't know the dimensions of the head on the drawing (which, as testified, was actual size) only tended to add to the painfulness of the incident. But as testified to by plaintiff's witness, *and to which no contradiction was attempted*, in the few cases that the button-head *type* is used in oil-burning engines the surplus material is eliminated and the objection, therefore, obviated. (Tr. 58, 76-7.)

We must here emphasize, since counsel for the railway company persists in assuming the contrary upon which to build his principal argument, that the plaintiff's evidence had nothing to do with types of construction. Her complaint was directed against the railway company's neglect to eliminate the excess material in the bolt-head when changing the engine from coal to oil. This could have been done by drilling part of the head off (as was done by

other roads when changing from coal to oil—Tr. 57) and still have retained their “button-head” *type*, if they were enamored with it. (Tr. 52, 76-7.) Plaintiff’s evidence was that where the excess material was allowed to remain in the bolt-head after changing to oil, an insulating gap would form between a large portion of the head and the crown-sheet, thus partially isolating the bolt-head from the water, which otherwise would conduct the heat away from the head. In time, as the evidence shows, this insulating gap would form to such an extent so that the bolt-head would become red hot every trip! (Tr. 36, 37, 57.) This, of course, was an exceedingly dangerous condition of affairs, convicting the railway company of the grossest kind of negligence. *If the railway company was going to risk unnecessarily the lives of its employees by not taking the ordinary precaution of drilling off the excess bolt-head material, the least it should have done was to repair the defective heads after the formation of the menacing insulating gap.*

The evidence is explicit that *only with the railway company at bar were the bolt-heads permitted to remain so dangerously large in oil-burning engines.* (Tr. 47, 71.) The railway company itself unwittingly furnished some of the strongest evi-

dence to corroborate this conclusion. These were experiments published in the proceedings of the American Society of Mechanical Engineers in 1897. They were brought into the case by the railway company who, at first, strongly relied upon them.

After a very strenuous endeavor by counsel for the railway company to prevent the disclosure of the real significance of these experiments, it was shown that, while these tests were made at a dull red or almost black heat and so in no event could militate against plaintiff's contentions, *the recommendation resulting from the series of experiments was the very contention advanced by the plaintiff at bar; the reduction in area of the head and the consequent elimination of the excess material; a recommendation, according to the evidence, of a head with the amount of material contended for by plaintiff.* (Tr. 86, 87.) Of course, the fact that counsel made such a vigorous objection to the making of this explanation of these experiments, introduced and at first greatly relied upon by him, did not tend to strengthen the railway company's case.

We shall not follow counsel in his discussion of the *weight* of the evidence given by plaintiff's experts. We did this in our brief in the State Su-

preme Court and showed in detail wherein counsel's reiterated statements that plaintiff's experts were inexperienced and had not sufficient ability to furnish satisfactory opinions were not borne out by the record, but were distortions of the meaning of the testimony as a whole.

For instance, counsel makes much of the fact that, while plaintiff's boilermaker (Pierron) testifies that from his *practical* experience it is dangerous to use the large Great Northern head in an oil burner, yet he is unable to understand the technical theory of it as given by plaintiff's technical expert. He *did* know from his practical experience that the railway company was engaging in a dangerous practice, but he did not know just *why*, technically, it was dangerous other than these bolt-heads *did* lose their holding power through crystallization and overheating. His theory, so far as he had one, was no different from that of plaintiff's other experts. If it were, then the jury had the right to disregard it and adopt the one given by plaintiff's technical experts. His frank statement, "I have never had any time to fathom out these things. I would not surmise at all," is a badge of truth and lends credit, rather than discredit, to plaintiff's case. This was in marked contrast to the

railway company's experts. Each of them pretended to give his opinion favorable to the defendant on all points of the case. It is no wonder that when the jury found from the direct evidence in the case that the opinions of defendant's experts of "low water" failure were clearly wrong, that the jury should also look askance on the other opinions expressed by them.

The fact remains, however, as is admitted in the railway company's brief (p. 18), there *was* evidence showing that the excessive quantity of material produced a weakened quality, which resulted in the explosion. The immediate cause of the explosion was, therefore, the defective condition of the deteriorated bolt-heads. It is consequently obvious that there is not involved in this case any question of standard construction or "type" of bolt-head. When counsels say "bolt-heads of this *type* (button-head) had been in use on oil burners for ten years on the Santa Fe; six years on the Oregon Short Line, and five years on the Great Northern" (Br. 41), he is merely pursuing his dominant policy of confusing the issue. It is true that the button-head *type* may have been used in oil burners, *but not with the excess of material which results in their dangerously defective condition.* As we have

already pointed out, in case where the button-head type has been used in oil burners, this dangerous feature has been eliminated.

We are at a loss to understand why counsel takes up the time of this court in comparing the weight of his evidence with ours. Surely he knows you are not going to act as a jury. Counsel took up the time of the State Supreme Court in the same wasteful fashion. But we shall not here, as we did there, trespass upon your time to enter into any such discussion of the weight of the railway company's evidence. It was indeed not nearly so formidable as counsel would make it appear. For instance, examine the *ex parte* tests relied upon by the railway company. (Br. 47.) Taken as they were intended to be, without examination, they are plausible, but a scrutiny quickly destroys their apparent force. They were metalographic tests made by a university professor and were designed to show whether certain marked bolt-heads taken from the engine (Exhibit 5 and Discs T-2 and L-2) had any weakness. But the test was a mere deception, since the admission was compelled that it was impossible to tell but that these particular marked heads from the engine had been just installed prior to the explosion and were, therefore, sound (442

bolts having been replaced in this engine in May, 1913—Tr. 151—and thirty or forty repaired the day before the explosion—Tr. 157). But the really curious feature of these tests, so far as their value was concerned, was that these tests, which, according to defendant's evidence, would "positively indicate" any weakness in the structure of the metal (Tr. 112), showed that Exhibits T-5, L-5, T-4 and L-4 were without *any* weakness (Tr. 112), when, as a matter of fact, these exhibits, traced backward, were those which had been actually subjected to the 6,000° oxyacetylene flame and *burned*. (Tr. 111.)

We analyze these *ex parte* "tests," not so much to demonstrate that they are intrinsically worthless to aid the defense and serve only to give a false impression, but they are referred to for the purpose of illustrating the mode of defense adopted by the railway company throughout the trial below. It is needless to say that these tactics, *when uncovered*, are far worse than none at all.

We might similarly analyze each item of the railway company's "expert" evidence. For instance we might point out how utterly misleading were its *ex parte* tests of applying an oil flame for about an hour to a bolt-head without getting it red

hot. (Tr. 110). For, when the jury was reminded that the plaintiff's evidence showed that *only after the substantial formation of the insulating gap, which permitted the heat to accumulate in the head, would the head overheat to a red-hot and permanently weakened condition*, it is obvious that this and the other "instantaneous" tests presented by the railway company only evaded the issue and attempted to confuse it. For this very reason, the trial court could easily see that an acceptance of the offer of counsel to heat up, in the presence of the jury, a locomotive furnished by defendant, to see whether the heads would become red-hot, would not only result in a lengthy collateral controversy, but would be of no real aid, since the value of that sort of a test would depend entirely upon the previous history of the bolt-heads.

We shall not, however, follow counsel's lead into what are to this court irrelevant discussions. In the case at hand the plaintiffs submitted testimony which, if believed, proved that the boiler of the engine which exploded was in a dangerously unsafe condition due to the railway company's gross negligence in not preventing the defect of the excessive material in the bolt-heads, or of repairing the defective condition of the bolt-heads after they

had negligently been allowed to deteriorate. (Tr. 23, 26, 27, 31, 33-37, 47, 54-57, 69). Testimony *was* introduced showing that the bolt-heads of this particular engine at the time of the explosion *were* defective and that this *was* the cause of the explosion. (Tr. 46, 54, 55, 56).

The railway company's arguments, not being based upon the record, must therefore fail. The fact is that plaintiff's case was not an attack on any standard design at all but upon the railway company's negligent creation of a very dangerous condition in its boiler by not preventing, or at least repairing, the defects in the bolt-heads. This dangerous situation could have been best obviated by cutting away the excess material, although still retaining the same design or type of bolt-head, when the locomotive was changed from coal to oil, as was done by other roads.

But were the facts otherwise, the railway company's argument as to "standard design" is unsound. For it is not true that a railway company may, as a matter of law, escape liability for dangerous machinery or places of work furnished by it to its employees on the ground that such machine or place is customary; that is, that such machine or place has been used as a standard by the other rail-

ways. That is to say, the negligence of the railway company at bar is not as a matter of law converted into due care because a considerable portion, or even all, of the other railway companies are similarly negligent. Consequently, were the bolt-heads in question in all respects identical with those used by all the other roads, still if, as a matter of fact, their use *unnecessarily* created an excessively unsafe place of work, which could be obviated by the use of common prudence, the question of liability becomes one for the jury.

In other words, the law does not allow the employers of labor in any given industry to make, by general neglect of their social duties, a rule of law for their own exoneration. This has been placed beyond controversy by repeated decisions of this court, of which *Wabash Railroad Co. vs. McDaniels*, 107 U. S. 454; 27 L. Ed. 605, is an example. In that case the contention for the railway company was that the question of negligence is to be determined "by the usages or custom which obtained in railroad management, and therefore the proper inquiry is: not what ought to be, but what is, the general practice in that business." But this court refused to sanction such a doctrine, saying, through Mr. Justice Harlan:

"Ordinary care, then, and the jury were, in effect, so informed, implies the exercise of reasonable diligence, and reasonable diligence implies, as between the employer and employe, such watchfulness, caution and foresight as, under all the circumstances of the particular service, a corporation controlled by careful, prudent officers, ought to exercise.

"These observations meet, in part, the suggestion made by counsel, that ordinary care in the employment and retention of railroad employees means only that degree of diligence which is customary, or is sanctioned by the general practice and usage, which obtains among those intrusted with the management and control of railroad property and railroad employees. To this view we cannot give our assent. There are general expressions in adjudged cases, which apparently sustain the position taken by counsel. But the reasoning upon which those cases are based is not satisfactory, nor, as we think, consistent with that good faith which, at all times, should characterize the intercourse between officers of railroad corporations and their employees. It should not be presumed that the employee sought or accepted service upon the implied understanding that they would exercise less care than that which prudent and humane managers of railroads ought to observe. * * * A degree of care ordinarily exercised in such matters, may not be due or reasonable or proper care and, therefore, not ordinary care, within the meaning of the law."

For an excellent statement of this rule, see the opinion of Mr. Justice Van Devanter in the

boiler explosion case of *R. R. Co. vs. McDonough*, 161 Fed. 657.

The doctrine was stated in standard form by Mr. Justice Holmes in these forceful words:

“What usually is done may be evidence of what ought to be done, but what ought to be done is fixed by a standard of reasonable prudence whether it usually is complied with or not.” (*Texas R. Co. vs. Behymer*, 189 U. S. 468, 473).

This principle is approved as well by the Washington courts (*Barclay vs. Puget Sound Co.*, 93 Pac. 430) as by many of the others. (See *Kirby vs. Railway Co.*, 129 N. W. 963, and *Railway Co. vs. Kelly*, 169 S. W. 738, as to the plea that the locomotive boiler was of “standard” design).

The railway company argues that there was no evidence of a *cause* for explosion. Overlooking the fact that such argument is built up of misstatements of the record, especially misstatements as to the absence of evidence, we can only understand such an argument by remembering that it disregards the commonplaces of the law. Substituting for the moment the railway company's imaginary record for the one actually before this court, and assuming that the plaintiff had only shown that the defective bolt-heads could have

produced the explosion and that the only other possible cause (low water) should be rejected, still the jury had the right to draw inferences from these circumstances and find as a fact that the defective bolt-heads *were* the cause of the explosion. In other words, the commonplace of the law disregarded by the railway company's argument is that the cause of the explosion need not be testified to directly but may be inferred indirectly from the circumstances. (*Choctaw Railway Company vs. McDade*, 191 U. S. 64; *Gill vs. Brown*, 169 S. W. 752; *Younger vs. Company*, 123 Pac. 772).

This applicable principle is stated precisely in the following widely-quoted words of the Supreme Court of Iowa:

“When a cause is shown which might produce an accident in a certain way, and an accident happens in that manner, it is a warrantable presumption, in the absence of showing of other cause, that the one known was the operative agency in bringing about the result.” (*Brownfield vs. Railroad Co.*, 77 N. W. 1038).

Woodman vs. Metropolitan Railroad Co., 21 N. E. 482;

Lunde vs. Company, 117 N. W. 1063, 8.

Brown vs. Coal Co., 120 N. W. 732.

Devine vs. Delano, 111 N. E. 722, 9.

Gould vs. Lighting Co., 121 N. W. 161, 6.

Sulzberger Co. vs. Hooker, 149 Pac. 887, 890.

As these cases point out, it is equally elementary that such inference may be drawn by the jury, even though it is not the necessary inference to be drawn. If counsel would cease to rely upon such overruled cases as *Wells vs. Celluloid Co.*, 65 N. Y. S. 370 (reversed on appeal, 67 N. E. 609), he would not be insisting that a plaintiff is obliged to exclude the possibility of some other cause, undisclosed by the evidence.

As we have already pointed out, an examination of the decisions confirms our experience that the plaintiff in boiler explosion cases (especially where the servant has been killed and his knowledge and testimony made unavailable) has extreme difficulty in securing evidence relating to the explosion, because the remains of the explosion are within the exclusive control of the defendant railway company, and the only persons who have knowledge of the matter are employees of the defendant.

The record at bar clearly reveals the tactics of the railway companies in this regard. Since the plaintiff's main contention was that some of the

bolt-heads—not the bolts—were deteriorated, and that the giving way of those deteriorated heads caused the explosion, it was important for the plaintiff to have access to these deteriorated heads. Accordingly, before trial, plaintiff made a motion for permission to inspect the crown-sheet, crown-bolts and bolt-heads. In compliance with that motion the railway company allowed an inspection of the crown-sheet and the crown-bolts, *but produced for inspection only three out of the 200 bolt-heads*. The record shows that counsel's then excuse for the refusal to produce for plaintiff's inspection before trial the really important evidence in their possession was that the railway officials "had no idea where they (the heads) were, and that they could not produce them." (Tr. 71.) Apparently having forgotten his previous refusal to produce more than three out of the two hundred heads on the plea of unavailability, counsel had, before our showing this fact to the jury, made the admission in open court that he *did* have others of the heads in his possession. (Tr. 65). This damaging admission was made by counsel in one of his numerous "challenges" during the trial that plaintiff at that time "test" the appliances from the wrecked engine then in the railway company's possession. Of

course, many of the heads in the boiler were sound as they constantly were being replaced and repaired—many just before the explosion. (Tr. 151, 157.) So counsel thought he was perfectly safe in trying to discredit plaintiff's case by his challenges that plaintiff inspect. But when the jury was reminded of the railway company's previous refusal to submit for inspection *all* the heads from the engine they, of course, instantly saw through the company's tactics. It was indeed only a matter of fortunate circumstance that the plaintiff at bar was able to produce direct evidence that the heads in the boiler were actually defective, and that *one* of the defendant's employees, the fireman Hansom, was fearless enough to give the whole truth.

There were two other charges of negligence against the railway company: the accumulation of scale and the absence of a safety fusible plug. But since this brief is already giving indications of interminable length we refrain from a detailed discussion of the evidence on these issues.

As to the scale: The presence of this would act as a non-conductor and cause the bolt-heads and crown-sheet to over-heat and weaken still more and thus contribute to the explosion. As to whether

scale was allowed to accumulate, the evidence was in irreconcilable conflict. Plaintiff's evidence was that there must have been such an accumulation of scale as to have contributed to the failure of the bolt-heads, which accumulation is preventable by proper boiler washing (Tr. 49, 72, 24). Much of defendant's evidence supported this contention and much of it contradicted it. The question was clearly for the jury.

As to the railway's failure to install a safety fusible plug in its oil burning locomotive: The railway company did request the trial judge to withdraw from the jury the question of the railway company's liability for the claimed negligent failure to install safety fusible plugs. In the State Supreme Court, the railway company pressed the contention that the lower court erred in not granting this request (Assignments 7, 8, 9, 18, 19; Tr. 236, 238). But counsel has not preserved these assignments of error for the consideration of this court and makes no argument thereon. However, as the State Supreme Court held, the evidence was sufficient to authorize its submission to the jury as a ground of liability, especially upon plaintiff's alternative contention that if, as a matter of fact, the water was low as claimed by the railway com-

pany, still the injury would not have occurred had there been a fusible plug to act as a safeguard. (On this point: *Hough vs. Moreland*, 169 S. W. 467.) Plaintiff's evidence went directly and unequivocally to the fact that it was both practical and convenient to use the safety fusible plug in *oil burning engines* (Tr. 71, 24) and that these safety devices are used to a great extent (Tr. 42-3). This is directly supported by the railway company's evidence, its witness (Daugherty) testifying that on *oil burning vessels* the conditions were the same as on *oil burning locomotives* as to using safety fusible plugs, and *that such safety devices are used*, except in the United States Navy and the only reason they are not used in the Navy is that the engineering officers there are so expert that they are not supposed to be subject to that test. (Tr. 177-8.)

Not only, therefore, was it customary on the sea under similar conditions to use the safety fusible plug in *oil burning engines*, but it was shown that the *great oil burning road* (the Southern Pacific System) used the safety plug, and that a great deal of the railway company's evidence of the non-use of the safety plug by some of the railroads touched

only their absence in the lower-temperated coal burners. This was merely another instance of the railway company's system of introducing evidence which merely tended to confuse.

Plaintiff's evidence also disclosed another reason why the absence of fusible safety plugs properly went to the jury as a ground for the railroad's liability. Plaintiff's evidence was that one of the uses of these safety plugs was that it acted as a notification of danger. When the crown-sheet becomes over-heated a number of times through scale and defective bolt-heads, and, thus deteriorating, retains progressively an undue amount of heat, the safety plug would melt *and act as a notification that the crown-sheet is in a dangerous condition and needed immediate attention.* (Tr. 77, 48.) No attempt was made to dispute this. All of the railway company's evidence went to the claimed unreliability of the plug to prevent the final explosion (although appellant's witnesses carefully refrained from giving any reason why this safety device was unreliable for that purpose).

We submit that the jury was properly allowed to exercise its function to decide upon the question of the railroad's negligence.

ASSUMPTION OF RISK.

SPECIFICATIONS 5 AND 6.

The trial court instructed the jury that if the "boiler was not in proper condition and safe to operate without unnecessary peril to life or limb by reason of the negligence of the defendant in any one or more of the respects alleged in the complaint" then the deceased did not assume that risk. The judge was, however, careful to add that if the boiler was safe, but still defective, due to defendant's negligence, and the deceased knew, or should have known of the defects, he assumed the risk and there could be no recovery. This instruction was in the exact words of the statute. The Employers' Liability Act provides that: "Such employee shall not be held to have assumed the risk of his employment in *any* case where the violation by such common carrier of *any* statute enacted for the safety of employees contributed to the injury or death of such employee."

The Locomotive Boiler Act (36 Stat. at l. 913, c. 103; U. S. Comp. St. Supp. 1911, p. 1333), is

entitled "An Act to Promote the Safety of Employees. * * * " and reads:

"It shall be unlawful for any common carrier, its officers or agents, subject to this Act, to use any locomotive engine propelled by steam power in moving interstate or foreign traffic unless the boiler of said locomotive and appurtenances thereof are in proper condition and safe to operate in the service to which the same is put, that the same may be employed in the active service of such carrier in moving traffic without unnecessary peril to life or limb, *and* all boilers shall be inspected from time to time in accordance with the provisions of this Act, *and* be able to withstand such test or tests as may be prescribed in the rules and regulations hereinafter provided for."

The trial court followed the plain wording of the statutes. It thought that Congress meant what it said when it abolished the assumption of risk defense for the violation "in *any* case, of *any* statute enacted for the safety of employees," and that consequently it included the Federal Boiler Act, which is *expressly* "An Act to Promote the Safety of Employees." Indeed the trial judge was but following the interpretation of these statutes by this court in *Seaboard Air Line Railroad Co. vs. Horton*, 233 U. S. 492, 503. That opinion, then just announced, expressly stated that the Boiler Act *was* included in the phrase "Any Act enacted for the safety of

employees." "By the phrase 'Any Act enacted for the safety of employees,' " said this court, "Congress evidently intended Federal Statutes such as the Safety Appliance Acts * * * 36 *Stat. at l.* 913 c. 103; *U. S. Comp. St. Supp.* 1911, p. 1333." The Boiler Act is 36 *Stat. at l.* 913 c. 103.

The argument directed against your conclusion in the foregoing case will not bear analysis. The statute prohibits the use of unsafe locomotive boilers and *adds* that all boilers shall be inspected from time to time and shall be subject to the jurisdiction and rules of the Interstate Commerce Commission and its inspectors. Counsel's idea is that the provision for government inspectors abrogates the customary private action for damages arising from the violation of this safety appliance statute. Or, to put it more openly than counsel cares to state it, the distinct provision prohibiting unsafe boilers is surplusage.

Let us first, however, call the court's attention to the fact that counsel's argument does not touch the case in hand at all. At bar there can be no question of conflict between the jury's findings and the governmental regulations as to the design or type of boiler. This is so for two reasons: The

plaintiff's case, as adopted by the jury, in no way attacked the *type* but merely complained of the negligence of the railway company in furnishing the deceased with a boiler which had been negligently allowed to deteriorate until it was a death trap. In the second place, the railway company's argument goes wide because it does not even pretend to claim that the Interstate Commerce Commission, or its inspectors, had ever approved, much less required, the defective bolt-heads in the case at bar. In fact, the railway company's own evidence shows that the government makes no detailed requirements as to how the boilers shall be constructed, so long as there is the required factor of safety. (Tr. 126.) Consequently, either *type* of bolt-head is acceptable, *when properly applied*. (Tr. 126.) It was plaintiff's contention throughout, not that the *type* was unsafe but that the type used was not *properly applied*; that is, if the button-head type was preferred by the railway company in their oil burners, it was not cut down, when the decision was made to continue to use the old coal-burner bolt-heads. If the case shall ever arise when the federal inspectors insist upon the railway's use of a certain design of appliance, and it is claimed that the use of that *design* is negligence, *then* a decision on counsel's

theory would be proper. No such case is presented here. No design is involved—only a defective, because deteriorated, appliance; and no conflict between Federal regulation and jury—because no regulation is claimed.

The fact is that neither Congress, by the Boiler Act, nor the Interstate Commerce Commission, under that statute, ever contemplated the futility of having the federal inspectors supervise the construction and repair of all the locomotives in the United States. As shown by §§ 5 and 6 of the Act, the primary burden of inspection and safety continues to devolve upon the carriers themselves. The Act says that the "*carrier* shall file *its* rules and instructions for the inspection of locomotive boilers" and that the *carriers* shall "make inspections" in accordance with those rules. The *carriers* shall "repair the defects which such inspections disclose."

That the Federal Inspection Service does not attempt to supervise or be responsible for the general design and construction of the boilers, but that the carrier determines and therefore is responsible for such design and construction, has been the attitude and practice of the Interstate Commerce Commission and its Boiler Inspection Department from

the beginning. For example, Rule 1 of the Interstate Commerce Commission (approved June 2, 1911, September 12, 1912, and June 9, 1914) provides:

“The railroad company will be held responsible for the general design and construction of the locomotive boilers under its control.”

In the first annual report of the Chief Inspector of Locomotive Boilers to the Interstate Commerce Commission (Oct. 5, 1912) it is said: “It is made the duty of the railroad company to know that all locomotives are in a safe and proper condition to operate before they allow them to be used. *This places the burden of inspection and the responsibility for the condition of all locomotives on the carriers, which was the manifest intent of the law.*” (p. 7.)

In his Fifth Annual Report (Oct. 9, 1916) he complains of the practice of a few carriers “in attempting to place the burden of inspecting their locomotives upon us by continuing to use defective equipment until it is found by a government inspector.” (p. 7.)

The evidence at bar shows this to be the actual working of the system. The government does not make specific requirements as to how boilers and

engines should be designed. (Tr. 126.) The federal inspectors have only a general supervision, since each inspector has several states to cover. And in a great many cases the requirements of the railroads are more rigid than those of the inspectors. (Tr. 164.) So that counsel's entire argument is founded upon a gross misconception of the functions and workings of the Federal Boiler Inspection Service.

Let us, however, meet counsel in his moot case. Assume the controversy at bar to be concerning the design of an appliance. Assume further that such appliance has been expressly approved by the federal inspectors. Is it the law that the cause of action arising out of the use of the unsafe appliance is abrogated because an inspector has inspected and approved it? Both reason and the authorities leave no doubt as to the answer.

The Safety Appliance Act under discussion contains two parts: (1) A prohibition against the use of unsafe locomotive boilers, *and* (2) A provision for their inspection under governmental supervision.

Now there are two principal ways by which the railways may be caused to use care in regard to locomotives. They may be made subject to civil suit for not using care, and they may additionally be

subjected to public prosecution secured by means of government inspection. There is, consequently, no foundation for the supposition that a statute which aims to improve the safety of railroad operation is actually self-destructive because it eliminates one of the most powerful deterrents of unsafe operation. This, indeed, is the very attitude of this court. In *Texas & Pacific Railroad Company vs. Rigsby*, 241 U. S. 33, it was expressly recognized that the Safety Appliance Acts contain no language explicitly conferring a private right of action for the violation of those statutes through the use of defective appliances. Yet this court, acknowledging that the safety of employees was the principal object of the statute, held that such a private right of action did arise. The reasoning which led this court to such a conclusion was not at all novel. It had been previously well settled that since Congress had entered the field of regulation in regard to safety of operation of railways, State legislation on the subject matter was excluded. It being then true that the states were powerless to give redress for injuries caused by defects, such civil liability should impliedly arise under the federal legislation because, as the court says:

“The consequences that follow a breach of

the law are vital and integral to its effect as a regulation of conduct, *liability to private suit is or may be as potent a deterrent as liability to public prosecution.*"

This court, having found that a private action existed for the violation of a safety appliance law, quickly arrived at the conclusion that, by the plain words of the statute, the defense of assumption of risk was not available.

This is obviously a very helpful decision for the case at bar. *For, in each of the Safety Appliance Acts (including the Boiler Act under discussion here) there exists identical supervision by the Government through the Interstate Commerce Commission and its Inspectors.* (Act of April 14, 1910, c. 160; 36 Stat. at l. 298; Act of May 27, 1908, c. 200; 35 Stat. at l. 324.) So that the railway company's argument, if tenable, would apply with equal force to each of the safety appliance acts, and thus destroy the private right of action repeatedly held by this court to arise from these statutes. Indeed this court has lately said (*Illinois Central Railroad vs. Williams*, 242 U. S. 462, 4) that the existence of such civil liability is "too clear for discussion."

We shall not burden the court with an extended review of the authorities which pass upon

and repudiate the railway company's contention, since we believe it is obviously devoid of all merit. Touching hastily upon the most prominent of these authorities, we find for example that the Boiler Act under examination has its counterpart in the federal legislation relating to steam vessels. (e. g. Act of March 3, 1905, c. 1456; 33 Stat. at l. 1028.) There, too, the Federal Government has provided for the inspection of steam boilers by federal inspectors under governmental supervision, and has indeed further specified in detail, the tests these boilers shall undergo and the manner of their construction. Although such legislation has existed since 1838 (5 Stat. at l. 304, c. 191; 10 Stat. at l. 61, c. 106) it has yet to be held that the supplemental feature of government supervision has withdrawn the right of private action. On the contrary, the right of action for damages resulting from steamboat boiler explosions has often been upheld by this court.

Swarthout vs. New Jersey Steamboat Co., 48 N. Y. 209; 8 Am. Rep. 541, is a case upon this federal statute where the argument at bar was presented to the court. It was there contended that the defendant could not be liable for the consequences of a boiler explosion since the law provided in detail in regard to the inspection of steam boilers by

federal inspectors, and that in fact the boiler had been so inspected and actually certified to be fully up to the requirements of the law. But the court of last resort in New York declined to be led by such reasoning, saying that the object of these safety appliance laws was to secure *greater* security against disaster and did not in any way impair the right of action for injuries caused by a defective boiler. The court affirmed the judgment for plaintiff, holding that the determination and certificate of the federal inspector that the boiler was safe could be overcome by evidence showing that in fact the boiler was improperly constructed and that a better and more improved mode of constructing the boiler would have saved the injury.

In *Caldwell vs. New Jersey Steamboat Co.*, 47 N. Y. 282, the same conclusion was reached. Following the principle of these decisions is the boiler explosion case of *Egan vs. Dry Dock Railroad Co.*, 42 N. Y. S. 188. The statute in that case required that a government inspector annually inspect each steam boiler and that the strength and security of each boiler be by him tested in a certain manner. It was proved that such inspection and tests were duly made. Nevertheless the servant offered testimony tending to show that the explosion was

caused by a defective boiler and that a different sort of a test than that prescribed by law would have revealed the defect. The court, following the cases in the New York Court of Appeals, overruled the master's contention that he could not be guilty of negligence because the inspection and tests prescribed by law has been made.

In *Johnson vs. Steam-Gauge Co.*, 25 N. Y. S. 689, the statute required "suitable and proper fire escapes, well fastened and secured and of sufficient strength." Plaintiff recovered on the theory that the fire escape was defective. The defense was "that the approval of the fire escape by the factory inspector operated as a compliance by the defendant with the requirements of the statute and as an answer to any charge of negligence." But the court declined to subscribe to any such doctrine, saying that the inspector's certificate could not operate to convert an obviously unsafe appliance into a safe one. The decision was affirmed by the New York Court of Appeals. (40 N. E. 773.)

In *O'Connor vs. Armour Packing Co.*, 158 Fed. 241, the defense in a personal injury action was that the federal inspectors had inspected and passed the carcass which the servant claimed infected him.

Notwithstanding this approval of the government inspectors who acted under federal statute, the servant introduced evidence tending to show that the calf upon which he worked for the master was diseased and that he became infected thereby. The contention of the defense was that the master was not negligent since the federal inspectors acting under law had inspected and passed the instrumentality which inflicted the injury, but the Fifth Circuit Court of Appeals after a careful review of the authorities, refused to sanction such a doctrine saying:

"as we have already stated, the master is in duty bound to exercise reasonable and ordinary care not to subject his servant to extraordinary danger by putting him to work in a dangerous place, with dangerous machinery or appliances, or on material dangerous to his health or life.

* * *

"The object of the federal statutes requiring inspection was to provide *additional* safeguards against the traffic in spoiled or diseased cattle and meats. They should not be so construed or applied as to deprive any one injured or damaged by the negligence or wrongdoing of a dealer in or a vendor of cattle or meats any remedy which he had under laws existing when the statutes were enacted. *We are not of opinion that the inspection by government officials of a place, machinery, instrumentality, or material necessarily and as matter of law releases the master from his duty to make*

such examinations and inspections as are required of him by the rule which demands that he exercise ordinary and reasonable care for the safety of his servant. This duty of the master is absolute and inalienable. He cannot transfer it to another so as to avoid responsibility. 4 Thompson on Negligence, § 3791. It would seem to follow that the court, in the absence of a statute requiring that course, cannot permit another to assume the responsibility for him." (After reviewing the authorities the court proceeds:)

"Granting the contention of the defendant that, to show the exercise of reasonable and ordinary care, it may avail itself of the inspection proved to have been made under the supervision of the government, it must of necessity follow that the defendant is burdened with the deficiencies, if any are shown, of such inspection. The defendant cannot ask more than that the case should be examined as if the government inspectors were its own inspectors. It is clear that the master's entire duty is not performed when he employs a competent and skillful inspector. This is only the first step necessary to secure the reasonable safety of his servant. There must be a reasonably careful and skillful inspection. Although the master may have engaged competent and skillful inspectors, if a servant is injured in consequence of a defect which would have been discovered by a reasonably careful and skillful inspection, but was not discovered, the master will be liable (citing authorities)."

In *Booth vs. Stokes*, 88 Atl. 490, the statute provided that "all machinery shall be properly

guarded." The same Act (2 May, 1905; P. L. 352-361; 6 Purdon's Dig., 13th ed. pp. 6121-6125) provided in detail for government inspectors and supervision. The court, in repudiating the contention now made by the railway company at bar, says:

"This is a statutory duty imposed upon the owner or person in charge of the establishment where the machinery is used, and a failure to perform the duty resulting in injury to an employe will render the owner liable. The approval or disapproval of the factory inspector is not the test of the owner's liability in such cases. * * * Where an employe is injured by reason of the failure of his employer to properly guard exposed machinery, the negligence consists of the disobedience of the employer, and not of the factory inspector, to comply with the statutory requirement. *The statute does not place the factory inspector in the management or control of the establishment, or take from the owner his control or management of the plant.* The purpose in the appointment of the factory inspector is, as declared by the statute, 'to more effectually secure the observance of the provisions of this act.' It is not his duty to provide guards for machinery in any establishment, but to enforce the provisions of the statute which require the owner or person in charge of the establishment to provide such guards. *It follows, therefore, that the approval of a guard in any case by a factory inspector is not conclusive as to whether the machinery is properly guarded within the meaning of the statute. The duty rests upon the owner of the establishment, and when the*

question is raised it can only be determined by a jury as any other question of fact."

Coming to the same conclusion are:

McGregor vs. Reid, 53 N. E. 323;

Consolidated Coal Co. vs. Seniger, 53 N. E. 733.

One needs no particular astuteness to discover that the argument at bar is an offspring of the one offered to this court by the same counsel in *Great Northern Railway Co. vs. Otos*, 239 U. S. 349. There he argued that since the act performed by the railway company (moving car to repair track) was one imposed by law, it could not result in a liability for damages, and that, besides, the plaintiff's act contributed to the injury. At bar this argument assumes the following fantastic form: that since the use of the appliance is (or might be) sanctioned by law, it cannot be the basis of a right to damages. But this court refused to accede to this argument, holding that civil liability for damages inflicted by reason of the defective condition of the appliance was not affected by the fact that the railway company was endeavoring to comply with the Safety Appliance Act, *nor that its act in compliance with the statute relieved the railway company of the consequences of the Federal Employers' Liability Act*,

which abolished the defenses of contributory negligence and assumption of risk in cases arising through the violation of a federal statute.

As we have already pointed out, counsel's idea is even less pertinent to the case at hand than it was in the *Otos* controversy. Need we reiterate that the use of the defective bolt-heads was *not* forced upon the railway company by the government?

The fact is, and the record so shows (Tr. 81), that the government has since this explosion recommended that the plaintiff in error so change their bolt-head as to eliminate the excess material, a recommendation substantiating plaintiff's contention.

It cannot be conceived, therefore, how the railway company can find the least shelter behind its plea that the law *compelled* it to maintain its locomotive boiler in a highly unsafe condition.

CONTRIBUTORY NEGLIGENCE.

Specification No. 7.

The railway company's contention here is plainly frivolous. The trial judge instructed the jury,

at the railway company's request, that if the explosion was due to the engineer's want of due care in allowing low water, the plaintiff could not recover. (Instruction No. 3, Tr. 198.) The court also instructed the jury that if the deceased was guilty of *contributory* negligence *that* would result in reducing the damages. The railway company claims these instructions are inconsistent. But knowledge of the meaning of the term "contributory negligence" dispels any semblance of merit to this contention. What is meant by contributory negligence once learned, it follows as of course that the instruction regarding contributory negligence could in no way conflict with, or have any bearing on, an instruction regarding a plaintiff's negligence which is the sole proximate cause of the injury.

Contributory negligence is negligence of the plaintiff which concurs or operates *with* that of defendant, and therefore presupposes negligence on defendant's part. *Contributory* negligence exists only when there is concurring negligence of the defendant. Obviously, then, an instruction on *contributory* negligence has no reference whatever to the plaintiff's negligence which is the sole cause of the injury. Such an instruction on *contributory* negligence applies consequently only to that sort

of plaintiff's negligence which concurs with defendant's negligence to produce the injury and not to plaintiff's negligence which is not *contributory* negligence at all, but is the sole proximate cause of the injury.

Having no bearing on that sort of plaintiff's negligence which is the sole cause of the injury, such an instruction can in no way be contradictory to an instruction on that subject.

Vandeborst Co. vs. Amarhine, 56 Atl. 833, 6.

Hummer vs. Railway Co., 108 S. W. 885, 7.

McCarthy vs. Railway Co., 14 So. 370, 1.

Wastl vs. Railway Co., 61 Pac. 9, 15.

Booth vs. McLean Co., 70 Atl. 104, 5.

Watkins vs. Railway Co., 38 Fed. 711.

If, then, counsel were correct in stating that there was no evidence of *contributory* negligence, the court's instruction that the damages might be *reduced* if they so found was one too favorable to the railway company. That is, the railroad's grievance is that the court erred in submitting to the jury a defense in its own favor (*contributory* negligence) when there was no evidence to support it. This, of course, affords no ground for complaint. (*Grand Trunk Railway vs. Lindsay*, 233 U. S. 42;

Selby vs. Railway Co., 32 Wash. 522, 8; *Labee vs. Railway Co.*, 59 Wash. 341; *State vs. Aton*, 67 Wash. 485; *Company vs. Stewart*, 55 So. 785—9th syll.)

As a matter of fact, there was evidence which tended to show that the deceased did not use due care. The railway company introduced evidence tending to show that it was the duty of the deceased to examine the locomotive and report the defects to be repaired. (Tr. 13, Br. 48.) Hence the railroad company had grounds to argue that the deceased was guilty of contributory negligence in recklessly going out with a defective boiler in defiance of the rule instructing him to have it repaired.

Aside from this, the railway company's argument is unfounded because it is obviously not true that if the deceased had allowed the water to become too low this would necessarily be the sole proximate cause of the injury. The jury might have found that the defective condition of the boiler and the negligence of the engineer in allowing low water both contributed to the explosion. In that situation the negligence of the engineer, although subsequent in time, and the negligence of the company in furnishing a defective boiler, would make

a case of concurring negligence wherein the injury would be said to be caused both by the failure of the railway company to furnish safe appliances and by the contributory negligence of the engineer in allowing the water to become too low. (See exactly in point the locomotive boiler explosion case of *Railway Company vs. Davenport*, 117 S. W. 790; affg. 110 S. W. 150.) Indeed, this was the very theory of the railway company in its pleadings when it set up as an affirmative defense that the injury was "*contributed to* by the negligence" of the deceased in allowing the water to become too low. (Tr. 4, 197.)

We say the railway company's present contention to the contrary is frivolous because it has been but recently rejected by this court in *Grand Trunk Railway vs. Lindsay*, 233 U. S. 42. There the appliance was defective and *subsequently* the servant went into the place of danger, himself giving the signal which caused the injury. It was contended that this intervening act of the servant was the proximate cause of the injury and that the court should have so instructed instead of allowing the jury to determine whether the servant's acts had been reasonably careful. But it was held by this court that under the view most favorable to the

railway, "the case was one of concurring negligence; that is, was one where the injury complained of was caused both by the failure of the railway company to comply with safety appliance act and by the contributing negligence of the switchman in going between the cars."

This court accordingly held that the instruction actually given was too favorable to the railway company. It being true that the acts of the servant could amount to no more than contributory negligence, then it followed, this court held, that it could not aid the defense in any manner, because contributory negligence had been wholly abolished in the event of the violation of a safety appliance act.

REPORT OF THE FEDERAL BOILER INSPECTORS.

SPECIFICATIONS 8, 9, 10.

An examination of the record discloses the utter lack of merit in these assignments of error. Indeed, had the verdict gone for the defendant, the incidents here discussed would have been the basis of plaintiff's appeal. The misconduct was entirely on the part of the railway company's counsel, as a brief statement of the facts will demonstrate.

The Federal Government made an official investigation of the explosion in this case. In the regular course of duty, an official report was made of the occurrence by the examining government inspectors. This certainly was competent (and highly persuasive) evidence, but is by statute made privileged. It was evidently thought that the federal inspectors would have a better chance to get the real facts from the railway company if the company knew that it had the right to exclude any evidence furnished by it of the real cause of the accident.

Scrupulously respecting this privilege, the plaintiff presented her case without once referring in any manner whatever, either by testimony, statement, or otherwise, to the fact that there was a government investigation and report. So far as plaintiff's case was concerned no one was even aware that the government had inspectors or exercised any authority in this field, much less that there had been a federal investigation and report of the explosion. After the plaintiff had thus completed her case without the slightest reference to the federal report (although it was, as a matter of fact, a demonstration of plaintiff's contentions and a complete refu-

tation of the railway company's theory—see the U. S. Chief Boiler Inspector's epitome of it in his Third Annual Report to the Interstate Commerce Commission October 10, 1914, p. 42) and after the plaintiff's opportunity of offering it in evidence had gone by, the railway company's counsel told the jury this:

“We will show that whenever an accident of this kind happens it is reported to the United States government and an inspection is made and reports printed and published, and the data is available so that the plaintiffs can have access to it, and produce it if they so desire, as correct.” (Tr. 89.)

The force of this serious reflection upon the good faith of plaintiff's case (in her concealing from the jury the government investigation) is not of course, so apparent from the cold record itself as it was to the trial judge, who, through his knowledge of the atmosphere of the trial, could adequately appreciate its effect.

The railway company was evidently laboring under the false impression that plaintiff's counsel knew nothing of the federal report, or at least had been unsuccessful in obtaining it from the federal government, as the whole subject had been by us so carefully avoided. In this false security, and *wait-*

ing until plaintiff's evidence was all in and her case closed, counsel for the railway company made the outrageous manoeuvre before the jury of issuing a challenge for plaintiff to produce the official report as a correct determination of the cause of the explosion.

It is now admitted by the railway company (Brief 103) that plaintiff's counsel (and therefore that jury) may honestly have understood this plain language as a consent to the production in evidence of this report. To keep this fact, that the federal government does exercise jurisdiction over these matters, prominently in the mind of the jury, the railway company in the presentation of its case continued to refer to the federal inspectors and their functions. (For an example, see Tr. 126.)

The courts do not add insult to injury by preventing the victim of tactics like this from protecting himself. Accordingly the authorities are uniform in holding that where one party opens up a subject the other has the right to protect himself by introducing, if necessary, evidence for that purpose (although the subject is forbidden by statute rather than by rule at common law, if that is a material circumstance).

In *Bogk vs. Gassert*, 149 U. S. 17, it was held that a party has certainly no right to object to the other party's introducing evidence (although forbidden by statute), where the complaining party had opened up the subject. This court said:

"The defendant himself, having thrown the bars down, has evidently no right to object to the plaintiff having taken advantage of the license thereby given * * *."

In *Merritt vs. R. R. Co.*, 38 N. E. 447, counsel made statements to the jury casting discredit on plaintiff for not having brought the case in his own state, where the witnesses were. Plaintiff then desired to refute this by showing that the laws of his state were not so favorable toward recovery as the forum, but the trial court refused to permit it and the verdict went for defendant. The Supreme Judicial Court of Massachusetts reversed the judgment, holding that plaintiff had the right to introduce evidence to refute such statements, since they tended to reflect upon plaintiff's case.

In *Mash vs. People*, 77 N. E. 92, defendant's counsel stated to the jury that defendant had a wife and that certain things could have been proven by her. In reply to this, attorney for the plaintiff (state) afterwards stated to the jury:

"I am willing to put her upon the stand if the defendant will permit us to do it. The state is not afraid to have her tell. Let's see how much it will help the defendant. It will send him to the penitentiary. That is what it will do. Mrs. Mash, come forward and take the witness stand."

In the Supreme Court defendant complained of this as error, the statute forbidding the wife to be used against her husband. But the court said:

"The quotation demonstrates that this was but in answer to an improper suggestion made by the attorney for the plaintiff in error when addressing the jury. Counsel for plaintiff in error, having first offended and thereby invited like departure from proper argument, cannot be heard to complain." (p. 94.)

So, in *Valley vs. R. R. Co.*, 38 Atl. 388, 4, defendant's counsel insinuated something to prejudice the jury against plaintiff, and the court, in approving the trial court's action in allowing the plaintiff to rebut the insinuation, said:

"* * * justice required that the plaintiff be permitted to rebut the suggestion by evidence tending to show that it was without foundation."

The railway company in the case at hand having itself thrown down the bar of the statute, has no right to complain of the plaintiff's effort to destroy the insidious effect of counsel's conduct.

An examination of the record also discloses that, in reality, these specifications of error present no question which this court can properly review. As we shall now show, there is in truth nothing here but questions of trial practice relating to the admission of evidence. This is plainly a matter of state procedure which raises no controversy in this court (*Central Vermont Railway Company vs. White*, 238 U. S. 507; *Roberts, Injuries to Interstate Employees on Railroads*, p. 16.)

Coming then to consider this phase of the matter, we find that after the railway company had thus, by statement to the jury and by testimony, cast discredit upon plaintiff's case by challenging plaintiff to produce the investigation by the government of the explosion, plaintiff referred to this report on cross-examination of defendants' witness Brenman. (Tr. 153.) No objection was interposed by defendant's counsel and the question and answer (in exactly the same form as those subsequently asked of the railway company's witness Dowling, about which counsel now complains) passed off as of course. The witness was excused, and when Mr. Dowling was called and examined at large by appellant as an expert, upon cross-examination counsel repeated the same line of questioning in regard

to the federal report, which had gone unchallenged with the witness Brennan. The railway company's counsel *interposed no objection whatever* until the very close of the examination in regard to the report, when he made the following objection to the last question asked:

"MR. DOREY: I object to it for this reason: I have sat here listening on this occasion and several other occasions to counsel reading from some typewritten copy or *fictional* typewritten report, not knowing where it came from, *insinuating in the question that it came from some government official or some mechanical engineer in the east, and attempting to give the jury that idea, attempting to get it in as evidence without there being any evidence or proof of it.* Now I am aware that the court will allow great latitude in the matter of cross-examination and *that the attorney will be permitted to make up a thing if he wants to,* and ask a witness almost any form of question, such as, 'Didn't so and so say such a thing?' whether he believes it or not, *and the question is not one that is perhaps objectionable, but it is in the discretion of the court how far that sort of thing should go. If counsel has anything, any document of this sort, he can offer them in evidence without insinuating them, or make proper offer at the proper time. If he has not it seems to me that this practice has been carried beyond the fair limit and that the court should take a hand. I object, it is passing the privilege of cross-examination.*

"MR. ZETTLER: Would you be willing to allow this report to go in the record if it is

the actual report of the federal inspectors?

"THE COURT: I will sustain the objection. I will say this to counsel: That I think there has been on both sides a whole lot of examination that serves no good purpose, *but it is not for me to raise the objection.* Exception allowed.

"MR. DOREY: I will say in explanation that *I do not want to appear as objecting unless it reaches an improper limit.*" (Tr. 167-8.)

When counsel did object, he did so on the distinct ground that the cross-examination on the matter had become too extended and on this ground *the objection was sustained.* Counsel not only did *not* object on any other ground, but he *expressly* disclaimed any other ground of objection.

Counsel, however, was not satisfied with the sustaining of his objection to plaintiff's efforts to mitigate the effects of the misconduct of counsel for the railway company. He must again unfairly accuse plaintiff's counsel with the worst of bad faith by directly stating that the government report referred to by plaintiff was "*fictitious*" and that plaintiff's counsel was "attempting to give the jury the idea that the report came from some government official." Please note counsel did not claim protection of the federal statute nor simply state that report has not been properly identified,

but he openly stated (to the jury we have no doubt), without any foundation therefor, that the report we had *was* fictitious. He then repeated his challenge (all in the presence of the jury) "*if counsel has anything, any documents of this sort, he can offer them in evidence.*" Of course, counsel for plaintiff immediately asked defendant if it had any objection to plaintiff's proving that this actually was the report and allowing it in evidence, and counsel then said: "Ask the court. Make your application."

Following the railway company's own direction, we attempted to get the report in evidence by first identifying it. Counsel did object to the preliminary questions as to identification but not on the ground of the federal statute. The objection was that "no sufficient foundation has been laid" and the general (and worthless) objection that it was "incompetent, irrelevant and immaterial." Although in accepting counsel's invitation, the report was preliminarily shown to be *the* report of the federal inspectors (and we here once for all deny counsel's statements that it was a mere *copy* of the report or that it was not properly authenticated—the record shows it to be the report itself—Tr. 168), when it came to be introduced, the railway

company's counsel objected vigorously, denying that he had in his opening statement challenged its production by plaintiff. Counsel for plaintiff, in support of the admissibility of the evidence, then sought to show that the railway company's attorney had waived any objection to its admission by having in his opening statement invited its production—but the court refused to allow plaintiff to do this, and because of the railway company's objection, the introduction of the report was abandoned.

We can now see that the whole controversy is one of state court practice. *The moment counsel invoked the protection of the federal statute, he obtained it.* Consequently counsel has no right to complain to this court. His failure to make objection, to move the court that the jury be instructed to disregard, or to move that the jury be dismissed, was each a sufficient answer to the railway company's grievance in regard to the report. These were all matters of state practice which were debated before the State Supreme Court and settled by that court against the railway company's contentions. (See, besides the decision under review, *Maffi vs. Stevens*, 108 S. W. 1008, 1010; *Keough vs. S. E. Co.*, 71 Wash. 466; and *Powell vs. McCord*, 12 N. E. 262, 5.)

In reality the trial judge erred *in the railway company's favor* because, under the authorities cited, the court should have allowed us to introduce the report in evidence. It is, therefore, obvious that, aside from the impropriety of here presenting this non-federal question of state trial practice, counsel's argument is devoid of all merit.

We respectfully submit that the judgment below is clearly right and should be affirmed.

JAMES McCABE,

HYMAN ZETTLER and

JOHN C. HIGGINS,

Attorneys for Defendant in Error.

